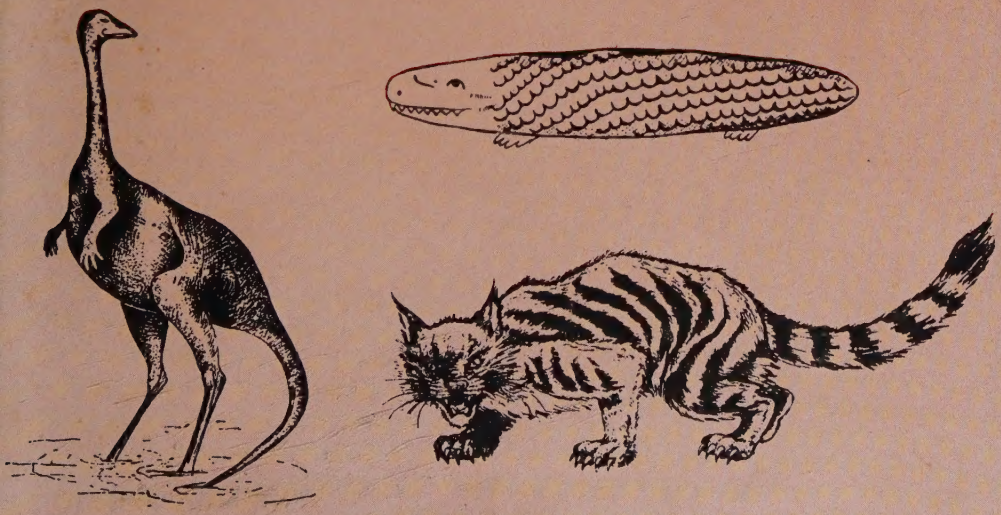
BERNARD HEUVELMANS

On the Track of Unknown Animals

With an Introduction by
GERALD DURRELL



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At the beginning of the nineteenth century Georges Cuvier, the "Father of Palaeontology," categorically stated that there was little hope that any large animals were still unknown. Since then have been discovered the largest species of bear and gorilla, a white rhinoceros, the pygmy elephant and hippopotamus, the bizarre okapi and the fabulous-looking Komodo dragon, and dozens of other large and unusual animals. Yet official zoology is still apt to repeat Cuvier's dictum. Dr Heuvelmans thinks otherwise, and with an immense wealth of reference, ranging through scientific literature in many languages from classical writers to obscure monographs in East Indian journals, examines the evidence about the animals which may yet be found and are still unknown to science. When natives' and hunters' reports of mysterious animals and palaeontologists' descriptions of fossil species now thought to be extinct begin to converge, may it not be that, like the Coelacanth, the animal is not extinct after all?

The creatures examined range from animals like the spotted lion of Kenya and the Queensland marsupial tiger, which are unsensational enough to be almost admitted in the official catalogue of zoology, to the more mysterious but equally well-documented abominable snowman and other lesser known ape-men that have been reported in south-east Asia. The author traces the history of the moa, the giant sloth and the mammoth, all of which were contemporary with man and are now known to have survived until much later than was at first thought, and argues that it is not impossible that they may still exist. He shows the close and fascinating similarity between various animals such as the *agogwe* and the *kongamato* which are firmly believed in by many natives although they seem so strange and terrifying as to be barely credible, with the indisputable palaeontological discoveries of such fossils as the Australopithecus, a tiny ape-man, and even the Pterodactyl.

The drawings of the animals on the cover are by Monique Watteau. More information about them will be found on pages 32, 112, 129, 193, 214 257, 303, 314, 413 *and* 474.

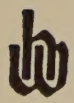
ON THE TRACK OF UNKNOWN ANIMALS

Ameranthropoides loysi, the only "unknown" animal of which there is a good photograph.

ON THE TRACK OF
Unknown Animals

BY Bernard Heuvelmans D.SC.

TRANSLATED FROM THE FRENCH BY Richard Garnett
WITH 120 DRAWINGS BY Monique Watteau
AND AN INTRODUCTION BY Gerald Durrell



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TO

DR SERGE FRECHKOP

who first led me into the muddy field of mammalogy,

in deep gratitude

and in the hope that he will not take amiss

this excursion on the frontier of science and fantasy

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Introduction

WHEN I was asked to write this introduction I agreed to do so with somewhat mixed feelings, as for a number of years I had been collecting material to write just such a book myself. However, after reading Dr Bernard Heuvelmans's book, my feeling of chagrin vanished, for I realised that the amount of information I had collected and the amount of research I had done were infinitesimal compared to his efforts.

Nowadays, to say you believe that in some parts of the world there may be quite large animals unknown to science is tantamount to admitting that you are slightly weak-minded. Come back from a remote part of the world and report that you have seen something which does not fit in with any category of known animal from that area, and you are branded immediately as a drunkard or a liar—or preferably both. It seems to me a very odd attitude to adopt, when you consider the vast areas of the world that, although they may be adequately mapped, are inhabited by only a scattered handful of people, most of whom have little knowledge of, and little interest in, the local natural history. I am referring now, of course, to what are laughably called "reliable sources of information," i.e. white officials on the spot. The indigenous inhabitants are well known to be most unreliable, since they have spent their whole lives on the spot and know most of the local countryside intimately. The fact that the officials on the spot have generally very little time for observing the animal life around them, and are in most cases uninterested in natural history is, I think, one of the strongest arguments in favour of finding unknown species.

I remember once in West Africa, after I had spent three or four months there collecting animals for zoos, I had my collection housed in a large marquee, and a local official paid me a visit to see the animals. I had at that time some 250 different kinds, and as I led him from cage to cage he became more and more amazed.

"I have spent twenty-five years on the coast," he said to me, "and I thought I knew it pretty well, but I have never seen any of these things before. Are they all exceedingly rare?"

Of course, the majority of the animals were not rare; some of them had been caught in fact within a couple of hundred yards of this official's bungalow. As he had never taken the trouble to look for them, he had never seen the creatures that inhabited his backyard in such quantities.

To say, therefore, that such a thing as a Nandi bear or an abominable snowman cannot possibly exist is an extraordinary attitude, and you feel that the people who adopt this argument would, on being presented with a hand-tame abominable snowman in a wrought-iron cage, remark —like the Irishman on seeing the giraffe for the first time—"I don't believe it."

In the last 150 years an astonishing number of large animals have come to light in the most odd places: the pygmy hippo, for example, in Liberia; and the okapi. This latter animal, incidentally, was known only as an extinct relative of the giraffe until it was discovered living and breeding in the Congo forests. In more recent years there was the discovery of the Congo peacock; the Indo-Chinese forest-ox; the Komodo dragon; and the king cheetah. This latter is, perhaps, the most surprising, since it was found in Rhodesia almost within a stone's throw of the capital of Salisbury, in an area that had been so well traversed by big-game hunters and zoologists that you would have thought nothing as large as this could have remained undiscovered so long. Most of these animals were known first from native reports about them, and, of course, in many cases the reports were disbelieved, since, as everyone knows, primitive tribesmen all over the world spend their spare time making up stories about animals in order to confuse and delude European zoologists.

It is curious how little faith is placed in a native report. The fact that, in the case of large predatory animals, the reports will naturally be highly coloured and exaggerated is surely no reason for dismissing them out of hand. When I was collecting in the Cameroons once, I obtained some rather unusual forest tortoises and lavished upon them all the foods that are normally beloved of the tortoise family: fruit, succulent leaves and occasional pieces of meat. To my extreme annoyance the tortoises refused to touch any of this food and grew thinner and thinner. An elderly native hunter one day, watching me trying to persuade the reptiles to eat, informed me, with ill-concealed amusement, that I was giving them the wrong thing. He went off into the forest and after some time returned carrying a calabash full of small white forest mushrooms. Before my disbelieving eyes he scattered these in front of the tortoises, and they fell upon them with avidity. Now, had he informed me that

these creatures ate forest mushrooms, I would, I regret to admit, have dismissed it as just another native tale.

So the argument of the sceptics runs: native reports are unreliable, and in any case the country is so well traversed that how could any large unknown species escape observation. Of all the parts of the world where you would think this argument held good you could hardly pick two better places than Bermuda and New Zealand. You would imagine by now that both would have been pretty thoroughly explored and worked over by zoologists and ornithologists, and yet since the end of the war two supposedly extinct species have been rediscovered, in Bermuda the *cahow* and in New Zealand the *Notornis*. When you think that these birds have been living and breeding in little pockets, as it were, under the very eyes of competent observers for so long without discovery, it is surely not straining credibility too far to imagine that in the vast, sparsely inhabited, or completely uninhabited areas of the world, such as the Congo forests, the great swamps of Africa, the Matto Grosso, the thick evergreen forest of Patagonia, or on the huge shining ramparts of the Himalayas, there may be found animals unknown to science.

Take the unfortunate, long-suffering sea-serpent as an example.[1] So much scorn and ridicule has been poured on the heads of those who stated in the past that they had seen curious monsters in the sea, that nowadays if one hauled itself ashore on Brighton beach during August Bank holiday, you would probably have difficulty in obtaining twelve witnesses who would be willing to come forward and risk the storm of disbelief that would descend upon them. Why, the experts would cry, don't we see them more often if there are such things? Why have their dead bodies never been washed up on shore? Of course, the reason we don't see them more often should become reasonably obvious to anyone who takes the trouble to glance inside a school atlas and work out the proportion of the world that is covered by sea, and the proportion of the sea that is covered by regular shipping routes. As regards the sea-serpent's corpse, one could point out that round the land masses of the world there is a fairly extensive shore-line, and most of it so sparsely inhabited that a couple of dozen sperm-whales could lie and rot in the sun without even being noticed. I wonder what proportion of people (even interested naturalists), who have spent all their lives in Africa, have seen the corpse of an elephant that has died from natural causes?

[1] The sea-serpent, with other unknown marine animals, will be dealt with in a separate work.

But the chief argument against the sea-serpents appears to be that if they *do* exist they must of necessity be a form of "prehistoric monster." Why everyone should consider this so impossible, I have yet to discover. The crocodile and the tortoise have come down to us almost unchanged through millions of years. The tuatara, of New Zealand, is a living fossil, as also is the okapi. And it is difficult to deny the prehistoric qualities of the Coelacanth.

Of course, the scientists want positive proof of the existence of these "mythical" creatures in the shape of skins and skulls, but they would make much better use of their energies in looking for them, rather than wasting their time desperately trying to disprove the few bits of evidence we have. It would be more to the point if they tried to obtain an abominable snowman rather than trying to prove that he does not exist by the curious argument that his enormous footprints are created by a leaping monkey the size of a dog.

Up to now most zoologists have treated the whole subject of sea-serpents, abominable snowmen and similar creatures as something that is not quite nice. It is as though they feel there were some gigantic conspiracy afoot to undermine their ideas of what does and what does not exist in the world. This attitude has made it extremely difficult to get at the facts behind reports of these alleged creatures. Whether they exist or not, it was essential for someone to collect all the reports and sift them through for publication. If the animals *do* exist and *are* discovered, this book will prove a valuable piece of research. If, on the other hand, it is proved that they do *not* exist, the book loses none of its value, for it becomes an important contribution to zoological mythology.

In this book Dr Bernard Heuvelmans has marshalled an astonishing parade of unknown animals, and he has done so with great skill and scientific detachment, resisting the temptation to sensationalise. To anyone who is interested in animal life it will provide a spur, making him feel he should leave immediately on the trail of one of these strange creatures. In these days of high-speed travel the world has become a rather drab place from an explorer's point of view, so it is nice to think that in the few remaining inaccessible parts of the globe there may be animals unknown to science, awaiting discovery. It is pleasant to imagine that the grandeur of the Himalayas shelters an abominable snowman, or that in the swamps of Africa there may be scaly monsters sporting in the waters, as their ancestors did millions of years ago, but it is to be hoped that they occasionally allow themselves to be discovered, if only to confound the sceptics.

GERALD DURRELL

Acknowledgments

THIS English edition is in many respects better than the original French edition published in 1955. It has been brought up to date and many errors and inexactitudes corrected; moreover, while much subsidiary matter has been abridged by the translator, a vast amount of unpublished material has been added. Some important chapters have been rewritten and several new illustrations have been included.

I am deeply grateful to the large number of people who, by giving me information which has often been invaluable, have helped me to compile my dossiers, particularly: Excellentissima Senhora Anna Isabel de Sa Leitão Teixeira of Rio de Janeiro; Professor A. Ledoux of the Faculty of Science at Toulouse; Dr Serge Frechkop and Dr André Capart of the Belgian Institute of Natural Sciences; Professor Paul Bonnivair, Honorary Inspector-General of Agriculture in the Belgian Congo; M. Lucien Blancou, Chief Game-Inspector of the French Colonies; Professor N. Boeff of the Faculty of Biology and the Zoological Garden at Sofia; M. Georges Sandrart, formerly the Resident in Ruanda-Urundi; the late Dr Walter Tamm, Director of the Hospital at Soerabaya; M. H. Dumont, French Consul at Bombay; M. Henri Pitaud, Director of the *Sociedad de Estudios Franco-Paraguayos* of Asuncion; Count Guy de Germiny of Florence; Count Christoph Vojkffy of Schloss Zeil, Württemberg; M. Pierre Srinati of Geneva; M. Robert Kirch of Spiez; M. Jean Delaborde, formerly Chief Paymaster of the French Navy; Colonel Alex Godart, late of the Belgian Congo Police; Commandant Imbard, of the Territory of the Ouargla Oases in Algeria; M. Henry Thétard, Founder of the Colonial Zoo at Vincennes; Dr Sam Thomas of London; Maître Marcel Bouquet of Casablanca; M. Morel, the chemist at Rosendaël; Señor Léo Bottenwieser of Buenos Aires, M. Jacques Blanchard of Paris, M. C. A. Loverdo of Athens; M. Pol Caput of Bordeaux; M. Cyrille de Neubourg and Charles H. Dewisme, the writers; and finally Mr Richard Garnett, the author of the present translation, who has proved to be not only a translator, but also a most diligent and valuable collaborator.

I should like to thank in advance any readers in Britain and America —which have given so many travellers, explorers, naturalists and scholars to the world—who can help me to complete my dossiers, either with their own evidence or by pointing out published material that I have overlooked.

I should like to take the opportunity of thanking those distinguished figures in the world of Natural History who have encouraged me in my researches into animals as yet undescribed by science, particularly Professor Roger Heim of the National Museum of Natural History in Paris and President of the International Union for the Conservation of Nature and Natural Resources, Professor Edouard Bourdelle, also of the Paris Museum, and Dr Maurice Burton, late of the British Museum (Natural History).

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Finally I should like to thank those who have given me permission to quote lengthy passages from their books: William Heinemann Ltd for *The Spotted Lion* by Kenneth Gandar Dower; Funk & Wagnalls for *Lost Trails, Lost Cities* (published in England under the title *Exploration Fawcett*) by Percy H. Fawcett; The Viking Press for *The Lungfish, the Dodo and the Unicorn* (published in England under the title *The Lungfish and the Unicorn*) and *Dragons in Amber* by Willy Ley; Simon & Schuster for *Trader Horn* by Alfred Aloysius Horn; Doubleday & Co. for *The Abominable Snowman* (published in England under the title *The Abominable Snowman Adventure*) by Ralph Izzard; Museum Press Ltd for *Cannibal Caravan* by Charles Miller; Mrs J. G. Millais for *Far Away up the Nile* by J. G. Millais; E. P. Dutton for *The Mount Everest Reconnaissance Expedition* by Eric Shipton.

BERNARD HEUVELMANS.

Part One

THE GREAT DAYS OF ZOOLOGY ARE NOT DONE

And no one has a right to say that no water-babies exist, till they have seen no water-babies existing; which is quite a different thing, mind, from not seeing water-babies; and a thing which nobody ever did, or perhaps ever will do.

"But surely if there were water-babies, somebody would have caught one at least?"

Well. How do you know that somebody has not?

"But they would have put it into spirits, or into the *Illustrated News*, or perhaps cut it into two halves, poor dear little thing, and sent one to Professor Owen, and one to Professor Huxley, to see what they would each say about it."

Ah, my dear little man! that does not follow at all, as you will see before the end of the story.

CHARLES KINGSLEY, *The Water-Babies.*

CHAPTER ONE

There are Lost Worlds Everywhere

> I think it is arrogant from a scientific point of view to deny the existence of things one does not know. I am not one of those scientists—respectable ones at that—who decree from their studies that the surprising stories of seeing unknown giant animals are mere fables. I maintain that the world still hides numerous species of giant and monstrous animals.
>
> LORENZ HAGENBECK, director of Hamburg Zoo, to a journalist.

> Even to-day there are in every part of the world inaccessible areas where there certainly exist wild creatures unknown to naturalists.
>
> JOSEPH DELMONT, the great animal-catcher.

MOST zoologists are sceptical about the possibilities of discovering new species of large animals, and some of them do not, with legitimate scientific scepticism, keep an open mind until the species is proved to exist, but categorically deny that it can possibly do so until they have been forcibly proved wrong. Their obstinacy is based on three propositions: the world has now been completely explored; no new animals have been discovered for a long time—at least not since the okapi; and many of the animals alleged to exist are fossil species and therefore long extinct. All three propositions are fallacies, as I hope to show in the first three chapters of this book.

Since this is the official attitude it is hardly surprising that the man in the street is contemptuous of the stories of unknown animals, often circumstantial and from reliable sources, so often and so summarily reported in the Press. Small wonder too that journalists are apt to treat the subject with facetious irony. And all too often their suspicions are justified.

In 1950 a photographic agency circulated a picture of a huge beast stranded on a beach near Suez, which according to the caption was a "mystery sea-monster." The creature in the photograph seemed to be a big whale with large curved tusks, but to the informed eye there was no doubt that it was an ordinary whale whose jaw-bones had been pushed out of its jaw by an accident: it had probably hit a mine or a ship's screw.

Just before the war, a number of newspapers and magazines announced that a living ape-man, called Azzo, had been discovered in North Africa, and published a photograph of him. Actually he was a poor microcephalous idiot, one of those cretins with a stunted skull that one sometimes finds among freaks in fair-grounds.

But a few bloomers of this kind do not mean that all reports of unknown animals are untrustworthy. Because one has been taken in by a liar there is no reason to disbelieve honest men. Yet this is what the public and the journalists do. And often this has disastrous results. The Press made such a laughing-stock of the Loch Ness monster, even though most of the local inhabitants had good reason for believing in it, that no scientific commission has ever dared to tackle the problem of what may be one of the most exciting zoological discoveries of the century. All because of the pernicious official attitude, based upon three fallacies.

The world is by no means thoroughly explored. It is true that we know almost all of its geography, there are no more large islands or continents to be discovered. But because a country is on the map it does not mean that we know all about its inhabitants. There are still more things in heaven *and earth* than are dreamt of in Horatio's philosophy.

Let us begin with the most unknown but least hopeful continent, Antarctica. It covers 5 million square miles, the area of the United States and Western Europe put together, and even after the International Geophysical Year is over I doubt if more than half of it will have been explored. Of course it is the most inhospitable country in the world, and boasts no known terrestrial mammals. The only amphibious ones, the seals, rarely venture far from the coast, nor do the penguins, petrels, gulls and skuas, which are all sea-birds. There is little hope of finding unknown mammals or birds in the middle of Antarctica, but there is a faint chance. During Admiral Byrd's great 1947 expedition to explore the continent, some of his airmen flying over Wilkes Land near the Knox Coast found an area the size of a small county, quite

free of snow and ice, 5 miles inland and 110 miles from the open sea. Bunger's Oasis, as it was named after David Bunger, who was the first to see it, was visited by helicopters and found to be scattered with small pools of salt water, full of seaweed of different colours. No doubt Antarctica holds other surprises.[1]

Greenland is hardly any better known. The central and northern parts have never been trodden by the foot of white man. But all this country has frequently been flown over by low-flying aircraft, from which you can clearly see seals lying in the sun and polar bears which are sometimes found 500 miles inland. On this white background everything stands out like a flea on a white sheet. This is why Paul-Emile Victor, the great French polar explorer, writes: "Perhaps one day hitherto unknown species of animals will be discovered in these regions. But it should be understood that they will only be small animals, like insects for instance."

Africa is infinitely better explored, but holds more promise for the naturalist. Although none of it is utterly unknown, except for a few patches in the middle of the Kalahari Desert, and thus there are few of those intriguing white blanks left on the map, much of it has been mapped but not explored. The geographer has only to take a series of geodesic bearings, often from mountains a long way off, to follow the course of rivers by canoe or along their banks and to fill in the gaps with aerial photographs. The naturalist's work often begins where the geographer leaves off, and the use of aerial photography gives the illusion that the world is much better known than it is. For there is not the least hope of finding out from an aerial photograph of forests or steppes of tall grass and bush what animals live there, even if they are as large as an elephant or a rhinoceros. There is even less if they are aquatic animals like the hippopotamus, the manatee and most of the large reptiles.

The likeliest country to contain large unknown animals is the great equatorial rain-forest in which six of the most important zoological

[1] It does. I have just learnt that in April 1958 the Soviet ship *Ob* discovered a new island 18 square miles in area, 450 miles from Vincennes Bay. What is far more extraordinary, *Youri Technik* of April 1958 reports that a Soviet expedition from Mirny found a warm lake 55 miles inland on the Antarctic continent in which there were baby seals less than a month old. Presumably they had been born there, but even so it is almost impossible to imagine their mothers crawling 55 miles—and what could they find to feed on?

discoveries of the present century have been made. The American naturalist Herbert Lang writes of it:

> Whoever penetrated here was, so to speak, "on the wing," and wings beat doubly fast across these inhospitable regions. The numerous sportsmen who had visited nearly all parts in Africa found no attraction in these forests. Indeed, the many pale, haggard faces that emerged from the western half of equatorial Africa were no incentive for pleasure-seeking people. The immensity of the wilderness is appalling; for over eighteen hundred miles without a break it stretches more than half-way across the continent, from the coast of Guinea to the Ruwenzori. In spite of tropical luxuriance, it is one of the most dismal spots on the face of the globe, for the torrid sun burns above miles of leafy expanse, and the unflagging heat of about one hundred degrees day and night renders the moist atmosphere unbearable. Over the whole area storms of tropical violence thunder and rage almost daily. Here natives have become cannibals, and the graves of thousands of white men are merely a remembrance of where youthful energy and adventures came to a sudden end.

Other little-known areas in tropical Africa are the mountainous parts of Kenya and Katanga and the areas of swamp or scattered lakes which might shelter large unknown animals; that is to say the Rhodesian lakes, the Addar marshes, which cover 1,500 square miles, or those of the Bahr-el-Ghazal, a tributary of the White Nile in Sudan, which are even more vast and some parts of which have never been crossed.

In Asia the Arabian desert of Dahana is, according to the geographer Maurette, "the least explored in the world. It is infinitely less well-known than the poles." But this arid and sterile tomb of ancient civilisations is chiefly of interest to the archaeologist. There is more for the naturalist in the foothills of the Himalayas and the valleys in the north and south-east of this great mountain range and in the vast Siberian coniferous forest, the *taiga*. In 1955 Soviet geographers were surprised to discover that whole ranges of mountains in the Kolyma and Indiguirka areas, the general shape of which was supposed to be known, actually stretched in quite unexpected directions. Where mountains can so long remain unknown, there is good hope for the naturalist.

Zoologists have far from exhausted the wealth of the tropical jungle in such supposedly known lands as India, Burma, the Moi country in Indo-China, Malaya, central Borneo and Sumatra. Nothing whatever is known about the mountainous centre of New Guinea except that various tribes, many of them pygmies, still live there in the Stone Age. In 1938 the American naturalist Richard Archbold accidentally dis-

covered in the western part of the island an excellently irrigated valley inhabited by 60,000 people. And in June 1954 patrol aircraft found quite unknown tribes in valleys in the south-west. Their population was estimated at 100,000, a third of the number of Papuans already known.

Most of the interior of Australia is covered with deserts of sand, salt and thorny bush. Even the least inhospitable parts are steppes of tall grass scattered with stunted shrubs. Hardly anybody goes there except a few prospectors, who come back with tales of animals so fantastic that they are usually thought to be drunken visions. But anything can happen in a continent where there are ranges of mountains which have never been seen except from an aeroplane.

The continent that holds the most mysteries is certainly South America. There are dozens of blank spots on the map. On the more accurate surveys the Amazon basin is as full of holes as a Gruyère cheese. Bertrand Flornoy, who has spent much of his life exploring this country, calls it "a vast night of trees which stretches for two million square miles." Four centuries of exploration have not got to the bottom of it, because, as Flornoy says:

> The virgin forest constantly opposes man's efforts with its irresistible power which transforms all decay into new life in a matter of hours. A path is no sooner opened than the jungle wipes it out. And, if you fly over the Amazonian forest, towns like Belem and Manaos in Brazil and Iquitos in Peru look like clearings. As to the clearings in which the Indians live, they are invisible.

Besides the heart of the Matto Grosso, a large part of Colombia is unknown, at least in practice, and so is the hinterland of Venezuela and Guiana and a large chunk of the Cordillera of the Andes. The wooded part of Patagonia is far from being thoroughly explored.

There is one part of South America which is of special interest, since it is a perfect example of an almost inaccessible nature reserve. It lies in that corner of Venezuela which includes the sources of the Orinoco. There, among the almost impenetrable jungle of the Gran Sabana, rise the *mesas*, vast limestone plateaux cut off from the rest of the world by sheer cliffs between 3,000 and 10,000 feet high. Some of these *mesas* are almost 20 miles long, great islands of thick vegetation about which often nothing is known. On those which have been explored rodents have been found that are unknown in the local forests but recall those of the Venezuelan Andes hundreds of miles to the west. In any case these

plateaux are not easy to reach. In 1937 Jimmy Angel tried to land his aircraft on the top of the Auyan Tepui *mesa* (or Devil's Mountain) but crashed in a swamp not far from the edge of the cliff. Even so, he was able to explore only a few hundred yards from the site of the crash, for the *mesas* are split by a network of deep crevasses. It was on this same *mesa* that Jimmy Angel recently discovered a waterfall fifteen times higher than Niagara. From the sheer 5,000-foot wall of Auyan Tepui gigantic columns of water fall 3,200 feet. As the top of the waterfall was usually hidden in clouds, the Taurepan Indians long ago told the conquistadors that there were terrible waterfalls that fell directly from the sky. Naturally they were not believed.

This may give some idea how little we know of the Venezuelan Gran Sabana. If the highest waterfall in the world should have remained so long unnoticed, how can we be sure that this country does not still conceal some unknown animals, even quite large ones? I do not suggest that we can hope to emulate Professor Challenger's success in Conan Doyle's famous precursor of science fiction, *The Lost World*, when he found on a similar plateau *all* the enormous reptiles from all parts of the world in the Mesozoic era and even some ape-men.[1] But it is absurd to insist that there can be *no* unknown animals in such little-known country.

In any case, animals of a past age do not need to be imprisoned on a small island or on the top of a *mesa* to be preserved from destruction by their subsequent competitors. A continent or large island will do as well. Australia is the marsupials' "lost world"; Madagascar the lemurs'; and New Zealand that of the rhynchocephalous reptiles and a once-flourishing empire of birds. Even on continents a particular habitat, unsuitable for most other creatures, can provide a very safe retreat for the species that have managed to adapt themselves to it.

But in fact for the zoologist the whole world is *terra incognita*, and not only for the ichthyologist who may bring up a new species every time he hauls in his net.[2] On land there is still hope of finding many new species—especially of small animals.

[1] As the great Colonel Fawcett has pointed out, this story was based not on the *mesas* but on the very similar Ricardo Franco Hills, farther south on the borders of Brazil and western Bolivia.

[2] During a systematic fishery of the Gulf of California in 1952 no less than 50 new species of fish were found. Yet the ichthyologists later realised that some of them could have been picked up with less trouble in the Mexican markets where they were regularly offered for sale.

The entomologist can make a scientific discovery by exploring his own garden. Nor need those concerned with other small freshwater or land invertebrates go far afield. In deep wells, caves and underground streams they can be sure of new and interesting finds. Cave-explorers bring so many new and unknown forms of life to the surface that a whole new branch of science has been formed to record and study their discoveries.

> But if we are content with small things [writes Dr Maurice Burton], insects, spiders and the like, there is no need to search the inaccessible places; we may quite easily find new forms on our doorstep.

The entomologist has the largest haul, which is hardly surprising, since three-quarters of a million kinds of known animals belong to the troublesome insect empire. On the average 5,000 new species or sub-species of insects are described each year. Discoveries of new land vertebrates—which are what we are concerned with here—are obviously less frequent, since there are altogether only 60,000 species and sub-species of amphibians, reptiles, mammals and birds known today. The following table will give some idea of how the numbers of known forms have increased since Linnaeus made his fundamental classification. The subsequent stages are marked by the works of those who have attempted a census or estimate of this kind. The figures for 1960 are, of course, approximate and have been obtained by extrapolation, producing the curve formed by the earlier figures.

	Linnaeus (1758)	Cuvier (1817)	Leunis and Ludwig (1886)	Karl Möbius (1898)	W. Arndt (1939)	? (1960)
Amphibians & Reptiles	181	239	3,400	5,000	5,461	6,000
Mammals	183	386	2,300	3,500	13,000	17,000
Birds	444	765	10,150	13,000	28,000	37,000

These figures imply that since the beginning of this century an average of about 15 reptiles or amphibians, 220 mammals and 400 birds have been described each year. Of course this does not mean that they were all really new and hitherto unknown. It is a pet foible of many zoologists to create new species and sub-species on the strength of barely perceptible differences, often by arbitrary divisions of known forms. All the same, we can reckon that one in ten of these descriptions refers to a clearly distinct species. Therefore each year the catalogue includes some

40 birds and 20 mammals that were hitherto unknown. The former are usually small song-birds, the latter little rodents or bats or even small marsupials or insectivores. Reptiles and amphibians are much rarer and almost an exception: there are no more than one or two a year.

As soon as you set about looking for large animals the area of the world to be searched becomes much smaller, and is generally restricted to the places I have detailed above. All the same, we should not forget that even without Antarctica, the regions that are little known or quite unexplored amount to no less than *one tenth* of the land surface of the globe.

Anyone who has travelled will agree that even in the supposedly best-known parts of the world there are less accessible areas where unknown animals might hide. In the Swiss, Bavarian and Austrian Alps a sort of stumpy "lizard" at least 2 to 3 feet long has frequently

1. Naïve drawing of the *Tatzelwurm* from a Bavarian hunting manual published in 1836.

been reported, although no one has succeeded in capturing a specimen. In fact the *Tatzelwurm*, or "worm with feet," is well known to all the Alpine people, though its name varies from valley to valley; sometimes it is *Bergstutzen* ("mountain-stump"), sometimes *Springwurm* ("jumping worm") in Tyrol, and sometimes *Daazlwurm* or *Praatzelwurm*. In the Bernese Oberland it is usually called *Stollenwurm* ("tunnel-worm"). It even appears in a Bavarian handbook for sportsmen and naturalists, the *Neues Taschenbuch für Natur- Forst- und Jagdfreunde auf das Jahr 1836*, where there is a curious picture of a sort of scaly cigar, with formidable teeth and wretched little stumps of feet. This picture was not drawn by the author himself, but from a description given by a friend who had shot one.

In the *Alpenrosen*, a Swiss almanac, for 1841, there is a picture of a *Stollenwurm* that is more probable and less of a caricature. At all events it is a better likeness of the beast described by the famous Swiss naturalist Friedrich von Tschudi in 1861 in his classic work on Alpine fauna, *Das Thierleben der Alpenwelt*:

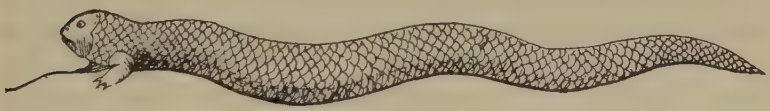
> In the Bernese Oberland and the Jura the belief is widespread that there exists a sort of "cave-worm" which is thick, 3 to 6 feet long, and has two short legs; it appears at the approach of storms after a long dry spell.

He says that "many honest and respectable people swear that they have seen it with their own eyes," and that at one time its identity was near to being discovered:

> In 1828 a peasant in the Solothurn canton found one in a dried-up marsh and put it aside intending to take it to Professeur Hugi. But in the meantime the crows ate half of it. The skeleton was taken to the town of Solothurn, where they could not decide what it was and sent it to Heidelberg—where all trace of it was lost.

This was a good opportunity missed, for even today no skin or carcase of what may be the largest reptile in Europe has ever been examined by a naturalist.

There can be no doubt that it exists. An inquiry made in the 1930's



2. A more plausible picture of the *Tatzelwurm* from the Swiss almanac *Alpenrosen*, 1841

by local newspapers and scientific magazines brought to light the evidence of some 60 witnesses. They all agreed that it was between 2 and 3 feet long and more or less cylindrical in shape, the tail end of the body ending rather abruptly. It was brownish on the back and lighter underneath. It had a short and thick tail; there was no narrowing at the neck; and its heavy and blunt-nosed head had large, round eyes. Its legs were slender and small; and some even maintained that it had no hind-legs at all. Some, but not all, said it had scales, but in any case it hissed like a snake.

Naturally some of the legends about the *Tatzelwurm* are suspect. It is said to be able to jump 2 or 3 yards, to be oddly aggressive for a lizard, to attack and wound cattle, and even to be venomous—so venomous that "its breath alone can kill you." But not all of these superstitions are so exaggerated. In 1908 a professional hunter, in whom A. von Drasenovitch had complete confidence, told this Austrian Privy Councillor that he had met the beast near Murau in Steiermark some 5,000 feet up. It looked like a monstrous worm 18 inches long and 3 inches thick, but

with four very short legs. Knowing its reputation, the hunter prudently drew his knife before approaching. As soon as he came close the beast flew in his face; he replied with his knife, but the blade would hardly penetrate its leathery skin. The "worm" made half a dozen attacks before it retreated into a crack in the rock to nurse its wounds. Despite the hunter's persistent attempts he could not make it come out or even find it again.

Although the stories about the *Tatzelwurm* are so common and so similar, many people have doubted its existence. One of the most frequent versions is that it is a stray otter; and indeed this animal could make fairly long jumps and hiss like a snake (or like a cat, for that matter). Another suggestion, made by the Swiss naturalist Revilliod, is that it is a mangy badger that has lost its fur. But those who had seen the beast, many of whom knew the local fauna well, insisted that they were not such fools as to mistake an otter or a bald badger for a *Tatzelwurm.*

Other sceptics have asserted that the legend will not hold water, since lizards are never venomous. This may be true as a rule, but there are two exceptions: the Gila monster of Texas and Arizona (*Heloderma suspectum*) and the Mexican *escorpión* (*H. horridum*). These big lizards,

3. The Mexican *escorpión* (*Heloderma horridum*).

which may reach a length of 2 feet 6 inches, well deserve all their names, for on their lower jaw they have a whole row of venomous fangs. When they bite they bury their hooked teeth in so deep it is impossible to make them let go. But though it is very painful to be bitten by one, it is not fatal for man.

They are squat, with a short, thick tail and fit the *Tatzelwurm*'s description so well that Jakob Nicolussi, an Austrian schoolmaster, went so

far as to baptise it *Heloderma europaeum*. He was too hasty, for the beast's identity is far from being definitely established.

On the other hand, the *Tatzelwurm*'s venom may well be merely a myth invented by the popular mind. There will be many instances in this book where people have tried to justify their fear of the unknown by pretending that a creature they rarely see is more terrifying than it really is. A correspondent of mine, Robert Kirch of Spiez in the Bernese Oberland, thinks that the *Tatzelwurm* may be a kind of large slow-worm, adding: "As to its terrible and dangerous character, it would seem merely that it is not so gentle as the slow-worm, that it doesn't like being tormented, and defends itself when it is attacked."

The slow-worm or blind-worm—or glass-snake as it is called in America—is of course neither a worm nor a snake, but a legless lizard. This tendency towards leglessness is noticeable in several families of burrowing lizards. Thus the skinks have legs so small that they barely touch the ground, and the two-legged worm-lizard of Mexico (*Bipes caniculatus*) has no hind-legs at all. This makes the statement that the *Stollenwurm* has only the two legs in front at once seem much less fantastic—indeed it helps to vouch for the animal. For how should the peasants in the Swiss mountains, who have certainly never heard of the Mexican worm-lizard, know that lizards may in fact have only two legs?

The worm-lizard is quite as stumpy as the *Tatzelwurm*, and so are certain skinks, such as the Australian *Tiligua rugosa*. Nor are skinks found only in distant countries; there is one species, *Chalcides striatus*, that is 2 feet long and lives in the French maritime Alps, which are an extension of the *Tatzelwurm*'s habitat. Even the *Tatzelwurm*'s size would not be extraordinary; in south-eastern Europe there is a giant slow-worm (*Ophisaurus apodus*) called *sheltopusik* in Russian, which reaches a length of 4 feet. It is not at all unlikely that there may be a large skink in the Swiss and Austrian Alps; and it would provide a most matter-of-fact explanation for the persistent Alpine legend.

According to an Austrian schoolmaster, who met one in 1929 while exploring a cave on the Tempelmauer, the *Tatzelwurm* is not a reptile but an amphibian. His account is as follows:

> Well-equipped, I started out on a spring morning (near the end of April 1929) and after a short climb I reached the top of the Tempelmauer. After a short rest between the cliffs I started to look for the entrance to the cave. Suddenly I saw a snake-like animal sprawled on the damp rotting foliage that covered the ground. Its skin was almost white, not covered with scales but smooth. Its head was flat and two very

short feet on the fore-part of the body were visible. It did not move but kept staring at me with its remarkably large eyes. I know every one of our animals at first glance and knew that I faced the one that is unknown to science, the tatzelwurm. Excited, joyful, but at the same time somewhat fearful, I tried to grab the animal but I was too late. With the agility of a lizard the animal disappeared in a hole and all my efforts to find it were in vain. I am certain that it was not my imagination that let me see the animal but that I observed with a clear head.

"My" tatzelwurm did not have large claws but short and atrophied-looking feet; his length did not exceed 40 or 45 centimetres (16–18 inches). Most probably the tatzelwurm is a rare variety of salamander living in moist caves and coming only rarely to the light of day.

Here I should mention that in the south of the United States there is a species of salamander (*Siren lacertina*) which has fore-legs only and may reach a length of 3 feet. It can survive long dry periods by burrowing in the mud and coming out only after the first rains. Might it not be for the same reason that the *Tatzelwurm* is most likely to be seen in the first storm after a long drought?

Towards the end of 1934 a Swiss photographer called Balkin claimed to have photographed a *Tatzelwurm* by accident. He was out taking photographs of views around Meiringen and saw what he thought was a very photogenic fallen rotten stump. Just as he pressed the shutter to photograph it, the stump began to move and proved to be a large and very hostile lizard. He took to his heels, and when he developed his film found that he had a picture of a quite unknown animal (see photograph facing page 40). It looks remarkably like a head-on view of Fig. 1, even to the markings on the head and the projecting teeth. It could be a genuine photograph, but it looks more like a photograph of a model of the beast in Fig. 1 than a living animal. At all events the *Berliner Illustrirte Zeitung* published it twice and financed a systematic search for the creature. The winter soon put a stop to this project. In the spring the beast was no longer news, and the search was shelved indefinitely.

Whether the *Tatzelwurm* is a European species of *Heloderma*, an enormous skink, a giant salamander or some completely new animal, there is little doubt that it exists. Even in a country every corner of which is known, not all the fauna is known to science. It will be a long time before all the world is really thoroughly explored. Many zoological surprises await us. And those who have listened to the tales and rumours which are current in various parts of the world, and which I shall recount here, will spare themselves a lot of trouble, for they will know where to look.

I think it safe to prophesy that it is in the most remote places that the strangest creatures will be found, creatures ill-adapted to the struggle for existence which have taken refuge in inhospitable and almost impenetrable country, creatures which are relics of once-flourishing groups which have been driven there by newer and more successful species. If there is any chance of finding really extraordinary animals on the earth, it will be in those very places where we have not looked—not exactly "lost worlds," but in those worlds almost all over the earth, which we have not yet found or not thoroughly searched.

CHAPTER TWO

Cuvier's Rash Dictum

> You must not say that this cannot be, or that that is contrary to nature. You do not know what Nature is, or what she can do; and nobody knows, not even Sir Roderick Murchison, or Professor Owen, or Professor Sedgwick, or Professor Huxley, or Mr. Darwin, or Professor Faraday, or Mr. Grove . . . They are very wise men; and you must listen respectfully to all they say: but even if they should say, which I am sure they never would, "That cannot exist. That is contrary to nature," you must wait a little and see; for perhaps even they may be wrong.
>
> CHARLES KINGSLEY, *The Water-Babies.*

MORE than a century ago, in 1812, Baron Georges Cuvier was rash enough to pronounce that "there is little hope of discovering new species of large quadrupeds." The living fauna of the world was well enough known for him. The animals even of such newly explored lands as America and Australia had been numbered and described. Naturalists should now concentrate on extinct animals, remains of which were being disinterred in such quantities. Zoology was out of fashion, palaeontology, the new science which Cuvier had fathered, was all the rage.

This pronouncement, like others of his, would not have mattered had he not been such a despot. Brilliant anatomist though he was, the ill-effects of his tyranny are still felt, and reactionary scientists still repeat his dictum, though it has been disproved over and over again.

In 1819 Cuvier had not long uttered his words when his pupil Diard sent him a drawing from India of a white-backed tapir saying:

> When I first saw the tapir—of which I send you a picture—at Barrackpore, I was astonished that such a large animal should still be unknown, especially as I had seen at the Asiatic Society the head of a similar animal which Governor Farquhar had sent there on 2 April 1806, saying that the tapir was as common in the Indian forests as the elephant and the rhinoceros.

4. White-backed tapir.

Actually the tapir had been known to the Chinese and Japanese since time immemorial, but whether Cuvier knew of the oriental descriptions —which is most unlikely—or not, he scorned all popular legends and beliefs of simple people. Indeed, he even distrusted all travellers' tales. Hence it was that he was still maintaining that the tapir was a specifically American animal, after Wahlfeldt mentioned a little black-and-white "rhinoceros" that looked very much like a tapir in Sumatra in 1772. Marsden had described it less equivocally in the same island in 1783. Sir Stamford Raffles had learnt about it in 1805, and Farquhar had shot one near Malacca and described it to the Asiatic Society in 1816.

But when Cuvier received Diard's letter and drawing he swallowed his scepticism for once and hastened to publish an official description, but he was too late. Someone else had beaten him to it.

The Indian tapir was only the first of a long series of large animals which were gradually discovered. I cannot hope to list them all here, but will confine myself to the most striking examples: animals which were quite new or could not easily remain undetected.

Three primates deservedly open the list. In 1820 Anselme Gaëtan Desmarest, the French mammalogist, announced the existence of a monkey (in the narrowest sense) big enough to be called an ape: the black or Celebesean ape (*Cynopithecus niger*), which is really a sort of would-be baboon with a very prominent snout. A year later Sir Stamford Raffles described the largest of all the gibbons, the siamang of Sumatra, which required a genus of its own (*Symphalangus syndactylus*); it stands more than 3 feet high on its hind-legs. And in 1835 the German

naturalist Rüppel discovered the largest of the baboons, the gelada (*Theropithecus gelada*) in the rocky mountains of southern Abyssinia. When it stands up on its hind-legs this "dog-headed" monkey which does not have a dog's head—its nostrils are not at the end of its nose!—may be as tall as a man, even though its legs are much shorter.

The water-chevrotain (*Hyemoschus aquaticus*) described by Ogilby in 1840 from a specimen brought back from Sierra Leone is admittedly

5. Water-chevrotain (after Frechkop, 1947)

not a large animal—it is only a foot high at the withers—but this little ungulate is important because it is the only living representative of a large group which lived in Europe during the second half of the Tertiary era. It was the first of many living fossils to be found in the great equatorial rain-forest.

In the same year an affair began which was not finally settled for another fifty years. The vice-president of Philadelphia Academy of Natural Sciences heard from a traveller who had returned from a long journey in Liberia, that in the inland rivers of that country there was a little hippopotamus hardly as long as a medium-sized heifer. The natives hunted it for its meat, and the traveller had not only seen the beast several times but had eaten it himself. Dr Morton was rather sceptical about this story, but in 1843 his friend Dr Goheen sent him a set of mammals' skulls from Moravia, among which he was astonished to find two not unlike a hippopotamus's but very much smaller. He

A photographer called Balkin claims that this is the legendary *Tatzelwurm*. But is it a genuine photograph?

The largest of the rhinoceroses, Cotton's white rhinoceros (*left*) was unknown until 1900.

The pygmy hippopotamus (*right*) was first described in 1849, but its existence was not universally admitted until 1912.

In the nineteenth century the okapi was thought to be mythical.

The largest of the pigs, the giant forest-hog was almost unknown in 1904.

Grévy's zebra was not discovered until 1882—in a zoo.

Przewalski's horse, the last surviving species of wild horse, was found in Mongolia in 1881.

The mountain gorilla (*above*) was thought to be legendary until 1903.

The gelada (*left*) is the largest of the baboons, and was the last to be discovered.

described them in 1849, naming the species *Hippopotamus liberiensis*, but his colleague Joseph Leidy soon showed that it differed from the ordinary hippopotamus in so many respects that it deserved to be put in a new genus, *Choeropsis*.

Despite the two skulls most scientists still denied its existence. Blainville in his *Mémoire sur les hippopotames* wrote:

> I have just learnt from R. Owen during his recent visit to Paris that last year Dr Morton described and drew under the name of *Hippopotamus minor*,[1] a little hippopotamus, probably from Gabon in Africa. It seems however, from what I hear from R. Owen who has seen the skull that the specific differences depend upon the size, and that the rest are of little importance.

6. Pygmy hippopotamus, compared with the large species.

Actually the pygmy's skull is only a little over half the size of the ordinary hippopotamus's and is obviously different to any layman's eye. Leidy, who had studied it thoroughly, wrote:

> In the anatomical details of the upper part of the skull, the differences are so great between Chœropsis and Hippopotamus, that any one finding a fragment constituted by this part of the former, from his previous knowledge of the latter alone, would not suspect it even of being closely allied to the genus Hippopotamus.

[1] This was Dr Morton's first name, which it turned out had been already used for a fossil species, so he at once changed it to *Hippopotamus liberiensis*.

But "R. Owen" had said otherwise. And he was Professor Sir Richard Owen, the greatest British palaeontologist, a fervent disciple of Cuvier and as brilliant an anatomist as his master, but none the less intolerant, prejudiced and sceptical. He was a man who could deny evidence when it was before his eyes, and, unfortunately, like Cuvier's, his word was taken as gospel.

Around 1870 a young pygmy hippopotamus, which weighed barely 30 pounds, was sent to the Dublin Zoo, where it lived for several weeks. Twenty years later Johannes Büttikofer, curator of the Rijksmuseum at Leyden, came back from two long visits to Liberia with much information about the pygmy hippopotamus's habits and even several skulls and skeletons in a rather poor state.

At the beginning of the twentieth century there were at least a score of specimens—many very fragmentary, it is true—in museums in various parts of the world. Yet many naturalists still thought *Choeropsis* was more or less mythical, some alleging it was just a young hippopotamus, others that it was an individual freak. A few more daring than the rest supposed that it was a small variety of the ordinary hippopotamus. There was even one natural history museum in which a badly mounted specimen was classified with the fossils—an original way of denying that the creature was extant!

Eventually, of course, its existence was established so that no one could deny it, but not for many years. For the moment let us leave the poor beast temporarily buried alive, and proceed to other discoveries.

The last century also had its own "abominable snowman," or rather "abominable man-of-the-woods," a terrible hairy giant that according to travellers' tales lived in the Guinea jungles. There were the same sort of rumours about it as are now current about the Himalayan *yeti*, which is said to be as strong as ten men, to be able to stun a yak with its fist, to strangle men and to carry off children but look after them well. The rumours about the African "man-of-the-woods" seem to go back to the fifth century before Christ, when the Carthaginian navigator Hanno fought and killed "hairy savages" on his famous journey. The interpreters called them *gorillas*. This incident occurred in a rather unlikely place, so it has been said that these *gorillas* could not have been gorillas, yet it is strange that their name should be so like that still used to describe the large ape in some dialects, for instance *n'giya* in Eveia and *n'gila* in Bakoueli.

For a long time there was a great confusion between the gorilla and

the chimpanzee. The two apes were, however, clearly distinguished in the sixteenth century by the English adventurer Andrew Battel, who was taken prisoner by the Portuguese, enrolled in their colonial troops and thus spent many years in Africa, chiefly in the forests around the River Banya and Mayombe. His story was published in 1625 in a collection of travels entitled *Purchas his Pilgrimes*. I have extracted the relevant passages.

> The Woods are so couered with Baboones, Monkies, Apes, and Parrots, that it will feare any man to trauaile in them alone. Here are also two kinds of Monsters, which are common in these Woods, and very dangerous.
>
> The greatest of these two Monsters is called, *Pongo*, in their Language: and the lesser is called, *Engeco*. This *Pongo* is in all proportion like a man, but that he is more like a Giant in a stature, then a man: for he is very tall, a hath a mans face, hollow eyed, with long haire vpon his browes. His face and eares are without haire, and his hands also. His bodie is full of haire, but not very thicke, and it is of a dunnish colour. He differeth not from a man, but in his legs, for they haue no calfe. Hee goeth alwaies vpon his legs, and carrieth his hands clasped on the nape of his necke, when he goeth vpon the ground. . . . They goe many together, and kill many *Negroes* that trauaile in the Woods. Many times they fall vpon the Elephants, which come to feed where they be, and so beate them with their clubbed fists, and pieces of wood, that they will runne roaring away from them. Those *Pongoes* are neuer taken aliue, because they are so strong, that ten men cannot hold one of them. . . .

Purchas adds that Battel, who was his neighbour,

> told me in conference with him, that one of these *Pongos* tooke a *Negro* Boy of his, which liued a moneth with them. For they hurt not those which they surprise at vnawares, except they look on them, which hee auoyded. He said, their highth was like a mans, but their bignesse twice as great. I saw the *Negro* boy.

Naturalists as enlightened as Buffon and Lord Monboddo, who lent a keen ear to travellers' tales and collected evidence to confirm Battel's, admitted that the great ape existed. But, of course, as Radermacher remarked in the 1780s, "the large species, described by Buffon and other authors as of the size of a man, is held by many to be a Chimera."

It was not until the middle of the nineteenth century that the American Protestant missionaries Savage and Wilson collected the usual legends about the large ape in Gabon, and also some skulls which found their way back to America. In 1847 Savage in collaboration with Professor Jeffries Wyman of Boston published a first brief description of

the gorilla, calling it *Troglodytes gorilla* to distinguish it from the chimpanzee, then known as *T. niger*. It was Isidore Geoffroy-Saint-Hilaire who, after studying two well-preserved specimens, recognised that the gorilla was quite different from the chimpanzee, and who created a new genus, *Gorilla*. Today, after a century of research, the "abominable man-of-the-woods" has not entirely lost the largely unjustified aura of terror with which it was surrounded in the legends.

When B. H. Hodgson was exploring Tibet and the neighbouring countries in 1850 a certain Major Jenkins gave him three skins and several skulls of sheep with grey wool which seems to be as large and heavy as a small buffalo. He christened it *Budorcas taxicolor*. It was well known to the Mishmis of Assam as *takin* and to the Khamtis as *kin*, but Hodgson was never able to see one himself. We now know three quite different species of takin. The golden takin (*B. bedfordi*), not discovered until 1911, is even more interesting than the two others, the first of which comes from Bhutan and Assam, the second from the Chinese province of Szechwan. It is very rarely seen, for the good reason that it lives in the Kansu and Shensi provinces in eastern China at a height of between 8,000 and 14,000 feet, and spends most of the daylight

7. The Himalayan takin.

hours in thickets of rhododendron and dwarf bamboo, emerging to browse on the grassy slopes only at dusk. It is by no means certain which group of ruminants the takin belongs to, since it has features in common with the ox, sheep and the antelope. It used to be thought to be related to the chamois, but it is now classed with the musk-ox.

The first takin brought back alive from Assam to Europe was a male which was presented to the London Zoo by J. C. White on 22 June 1909, 59 years after the beast was discovered.

Schomburgk's deer (*Rucervus schomburgki*), which was described by Blyth in 1863, is remarkable not only for its curiously forked antlers which may boast as many as 20 points, but also because it has never been seen in its natural habitat in Siam by a single white man. All that is known about it has been learnt from rare specimens captured by the Siamese or born in captivity. There is indeed little hope that any European will ever see it in its natural state, for it is quite likely that it has been extinct for several years.

The same fate awaits many animals known only from rumours and legends, which makes one all the more impatient with those who obstinately refuse to listen to evidence of this kind.

Occasionally an intelligent naturalist with his ears open has been able to save a species. When the French missionary Father Armand David crossed eastern Asia between 1865 and 1869, he not only recorded a great number of new plants but also discovered three new kinds of large mammals. Had he not been incurably curious there would be no *mi-lus* alive today.

When he was in Pekin in 1865 he heard that sacred animals were kept in the Nan Hai-tzu Imperial Park several *li* south of the city. His curiosity was aroused, but he knew that entry to the park was strictly forbidden; so he eluded the Tartar guard by climbing the 45-mile wall that encircled the park and protected it from curious eyes. He was most excited by what he saw. Besides the animals that he knew well, there was a large herd—some 120 head—of deer so strange that the Chinese called them *sze-pu-hsiang* or "like none of the four." This meant that they were "not like a deer," "not like a cow," "not like a horse" and "not like a goat"; presumably because they resembled each of these four animals, but only in a few particulars, having the general anatomy and antlers of a deer, a tail as long as a cow's but ending in a hank of horsehair like a horse's, and large spreading hooves like a goat's. Fortunately the beast also went by the less cumbrous name of *mi-lu*.

By bribing some of the keepers, Father David managed to procure a pair of antlers, which he rightly valued as the *pièce de résistance* of the collection he was about to send to the Paris Museum. The following year he obtained two skins in a fairly good condition. As soon as it was known in Europe that a new kind of deer was kept in the Imperial Park at Pekin, the diplomats of several countries set about trying to obtain specimens. Thanks to the Imperial Minister Hen-Chi, the first three

8. The *mi-lu*, or Père David's deer.

living *mi-lus* were presented to France. They did not survive the voyage, but Alphonse Milne-Edwards was able to study their remains and publish a description in 1866, christening the species *Elaphurus davidianus*. It is a graceful and sad-eyed deer, with light tawny-brown fur in a shaggy coat which rises to a mane on the neck. Unlike most other species it sheds its antlers twice a year.

Further specimens were sent to other countries at the instigation of their respective ambassadors, and fared better than their predecessors.

In 1895 floods destroyed a large piece of the wall round the park, so that some of the *mi-lu* escaped and were slaughtered and eaten by the starving population.

The Boxer Rebellion in 1900 was even more fatal. The rebels invaded the Emperor's grounds and slaughtered all the deer but one. This turned out to be the only surviving *mi-lu* in the whole of China, for the species had been completely exterminated in the marshy plains of northern China several centuries before.

Fortunately Father David had climbed the wall, and thanks to him a few rare individuals of what is generally called "Père David's deer" had been preserved in Europe, where the Duke of Bedford was able to save the species from extinction. In his park at Woburn Abbey, 15 breeding survivors have so multiplied that now, after half a century, there is a herd of 250, from which several zoos have been provided with specimens.

On Chinese vases and silk-paintings you can sometimes see a sort of grinning demon with a turquoise-blue face and tail. All the front of its body is as red as fire—which is natural enough for a demon—but incongruously it has an impertinent little *retroussé* nose. This beast, which no European naturalist dreamt could exist, was Father David's second great discovery. It turned out to be a not so very stylised picture of a monkey that lived in the snowy heights of eastern Tibet, and this only increased the sceptics' incredulity, since everyone knows that monkeys prefer a warm climate. Nevertheless it was perfectly true that this monkey (see Fig. 42) was found at altitudes of over 10,000 feet and well deserved to be called "snow-monkey." In 1870 Milne-Edwards, after examining its skin, christened it *Rhinopithecus roxellanae* after Roxellana, the beautiful snub-nosed slave who married Suleiman II and thus showed that fairy-tales could sometimes come true.

Father David was taking tea and eating sweets with a rich landowner called Li in Szechwan on 11 March 1869 when he made his third great discovery. In his host's house there was a curiously marked fur which he recognised as that of "the famous black-and-white bear" which he had several times heard tell of. In Yunnan they gave the name *bei-shung* (or *pai-hswung*) to an animal which was said to live in the bamboo forests on the mountain-sides. As far as I know, the first mention of the *bei-shung* is in a manuscript dating from A.D. 621, during the reign of the first of the T'ang emperors.

Father David was convinced that this legendary animal existed, and

urged the Chinese hunters to get him a specimen. Twelve days later, on 23 March, they brought him a young *bei-shung* which they had caught alive, but had killed in order to carry it home with less trouble. Thus he was the first westerner to obtain the fur of what we now call the giant panda. It is white all over its body except on its legs, the top of its chest, its shoulders, its ears, the tip of its nose and around its eyes, where it is dark brown, almost black. Unlike a true bear, it has hair even on the soles of its feet.

9. The giant panda's closest relative, the panda.

On 1 April the hunters brought Father David the skin and skeleton of an adult *bei-shung*, and six days later he obtained a pretty little flame-coloured animal already known to science, the panda (*Ailurus fulgens*). The word panda is thought to be a corruption of the native name *nyala-ponga*, "bamboo-eater." Actually the Chinese more often call it *hun-ho* or "fiery fox." In English it is sometimes called "Himalaya raccoon" because of the rings round its tail, and it is in fact related to the American raccoons.

Father David certainly never guessed that this kittenish little creature was related to the big black-and-white "bear" whose remains he had

e giant panda was
: discovered in 1869,
no living specimen
captured until 1936.

e Komodo dragon
ow) is the largest of
lizards. It was
ught to be a legen-
y monster until 1912.

The pygmy chimpanzee was first discovered in a museum in 1928.

just collected, and it remained the "bamboo-bear" or "Père David's bear" for some time. But when Milne-Edwards had studied its dentition and its skeleton he realised with a touch of genius that it was related to the Procyonidae, the raccoons, and gave it the name of *Ailuropoda melanoleucus*, or "the black-and-white animal with panda's feet."

It only remained to find the giant panda in its natural habitat and capture a specimen. But this was sooner said than done. The expeditions organised to look for it came to nothing. General Pereira, who travelled from one end of Tibet to the other, found not a trace of the animal even in the native tales.

The giant panda had hardly been discovered when it seemed to disappear without leaving a trace. No more was heard of it for over half a century.

The crested rat (*Lophiomys imhausi*) is certainly the most conspicuous of rodents. It may reach a length of 16 inches and its body is covered with a coat of long black and white hairs, which stand up to make a striking crest along its spine. Yet this creature, which lives among the rocks in the mountains of East Africa, was not discovered until 1867, when it was immediately described by Alphonse Milne-Edwards, who was then having a remarkable run of luck. This rodent was so unusual that a whole new family had to be created to accommodate it.

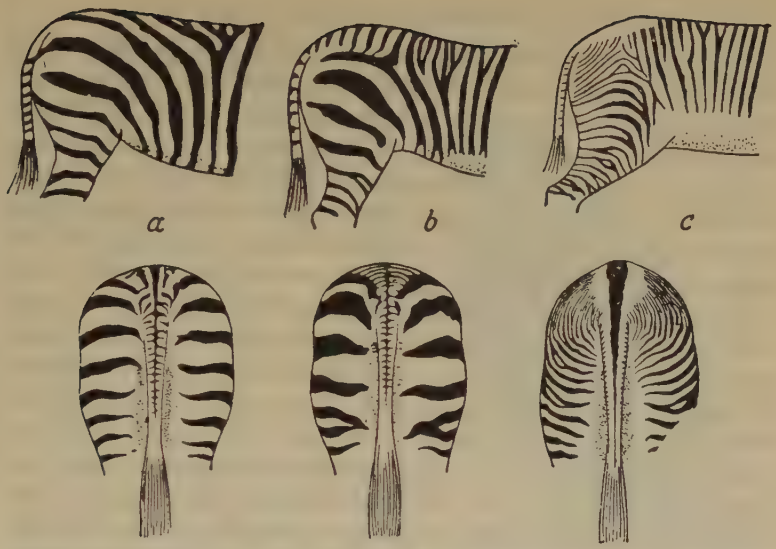
Six years later another no less extraordinary rodent came to light and also added another family to this order. It was the *Dinomys branickii*, often known by its native name of pacarana. This beast looks like a marmot, and so is much less striking than the crested rat, but it is nearly 2 feet long—the size of a fox-terrier. Yet, though it is one of the largest rodents in the world, it was not known until 1873, and then not particularly well. Professor Walter Henricks Hodge of the University of Massachusetts, one of the greatest experts on the pacarana, writes:

> This giant rodent is at home in the region of mountain rain forests in the eastern Andes from Peru to central Colombia. For many years the Pacarana was known only from the original specimen that was captured in 1873 as it wandered about in a *hacienda* building at the hamlet of Vitoc, Peru, at the headwaters of the Perené River just east across the Andes from Lima. Until 1904 the species remained out of scientific headlines, but in that year two living Pacaranas were seen in Pará from the upper Rio Purus in Brazil. In 1922 a series of specimens was obtained from the forested Andean area to the east of Lima; and, finally, in 1925 the New York Zoological Garden obtained a living specimen for exhibition. In 1930 two additional Pacaranas were

obtained and about the same time the species made its zoo debut in Hamburg and London. Thus all our present knowledge of this animal is based on less than fifty individual specimens. The information concerning this giant rat has remained in fact so scanty that as recently as 1942 it was included among a list of extinct and vanishing mammals of South America. Rare it seems to be but whether on the road to extinction is another question. Pacarana territory includes some of the most precipitous and consequently inaccessible and unknown forested country in the world. Only a few trails or roads cut into this terrain and only after this *terra incognita* is better known to field zoologists can we state with certainty the status of this rare rodent, which may be much more abundant than the few existing records would indicate.

Between 1869 and 1882 a good half-dozen new animals were added to the Ungulates, the order which includes most of the larger land animals. In 1869 Blyth described a new species of African antelope with corkscrew horns, the lesser kudu (*Strepsiceros imberbis*). In 1870 Swinhoe announced a new kind of deer in the Chinese marshes, the

10. The gerenuk or Waller's gazelle with its unusually long neck.



11. The peculiar pattern of the skin of Grévy's zebra (*c*), compared with that of Burchell's zebra (*a*) and the mountain zebra (*b*), (after Frechkop, 1947).

Chinese water-deer (*Hydropotes inermis*), which was an ancient type, being quite without horns. The following year Milne-Edwards kept up his brilliant series of descriptions with another Chinese deer, the tufted deer (*Elaphodus cephalophus*), which had short antlers consisting of mere stumps almost hidden by tufts of hair on the crown of the head, but the male was armed with protruding canine teeth.

In 1872 and 1878 Sir Victor Brooke christened two African gazelles. The first, Grant's gazelle (*Gazella granti*), was merely a new species, but the second, Waller's gazelle (*Litocranius walleri*), belonged to a quite new genus. It is a most unusual-looking beast with a neck as long as its body—a sort of giraffe-gazelle. It is confined to Somaliland and British East Africa. The natives call it gerenuk and have known it since time immemorial, and it appears in Egyptian bas-reliefs dating from the sixth century B.C.

All too often zoologists make the mistake of underestimating ancient or primitive art as a source of information. Had they studied Egyptian murals more carefully they would not only have noticed the gerenuk, but also a zebra with particularly narrow and numerous stripes. The Scottish explorer James Augustus Grant—after whom the gazelle was named—claimed to have seen one of these zebras in Abyssinia in 1860, but the experts were still sceptical.

In 1882, however, Menelik I, Emperor of Abyssinia, gave the French President, Jules Grévy, a zebra which exactly fitted Grant's description. When it was brought to France and desposited in the Jardin des Plantes everyone could see that it was a new species, which was larger than the other zebras and had a different pattern on its coat. The poor brute was worn out by its long journey and had a fit and died several days after its arrival. All the same, Oustalet was able to add another new large quadruped (*Dolichohippus grevyi*) to the world's fauna.

At about the same time the news reached Europe that the Russian explorer Nikolai Mikhailovitch Przewalski, the first to explore Central Asia, had discovered a species of wild horse in Dzungaria in Western Mongolia. Actually, though he was a cavalry officer, Przewalski had taken it for an ass, for it had a large head and relatively short legs. I. S. Poliakoff, who published the first description of it in 1881, needed all his patience to convince him that it was really a horse, a horse (*Equus przewalskii*) which immortalised a name all too difficult to remember correctly. It is the only living example of a truly wild horse—and not a descendant of tame horses that have gone wild, like those in America. The very last specimen of the only other surviving wild horse, the tarpan (*Equus gmelini*) of the Polish forests and southern Russian steppes, died in the Ukraine at Christmas 1879. Hence the special importance of Colonel Przewalski's discovery. In 1955 Street alleged that Przewalski's horse had disappeared in its wild state, but in the same year the Soviet zoologist Professor Bannikov estimated the number in a wild herd at some 40 individuals. There are small herds in zoos at Munich and Prague which breed and have thus been able to supply other zoos. Whipsnade received a pair in 1954.

In 1891 Oldfield Thomas christened another large quadruped, the dibatag antelope (*Ammodorcas clarkei*), commonly called Clarke's gazelle because it was discovered in Somaliland by W. H. Clarke.

Here I wish to add a large bird to the list. You may object that no bird, however big, can be a large quadruped, and that Cuvier never suggested that there was little hope of finding new species of large birds. True, but this was certainly because he thought there was *no hope at all*. There are no more conspicuous creatures than birds. Their ability to fly away at the first alarm means that they do not have to hide so much as mammals. For the same reason they can wear brilliantly-coloured plumage without suffering for it. Certainly it is very rarely that a large and quite unknown bird is discovered.

Nevertheless Father Jeffery Whitehead discovered one. In the island of Samar in the Philippines he shot a large crested eagle—or rather a harpy-eagle—with several very unusual features. Its beak was unusually long and was used for the grim purpose of dismembering small monkeys. In 1896 W. R. Ogilvie Grant christened it *Pithecophaga iefferyi*, "Jeffery's monkey-eater," an apt name as well as a pleasantly informal tribute to Father Whitehead.

12. The monkey-eating eagle of the Philippines.

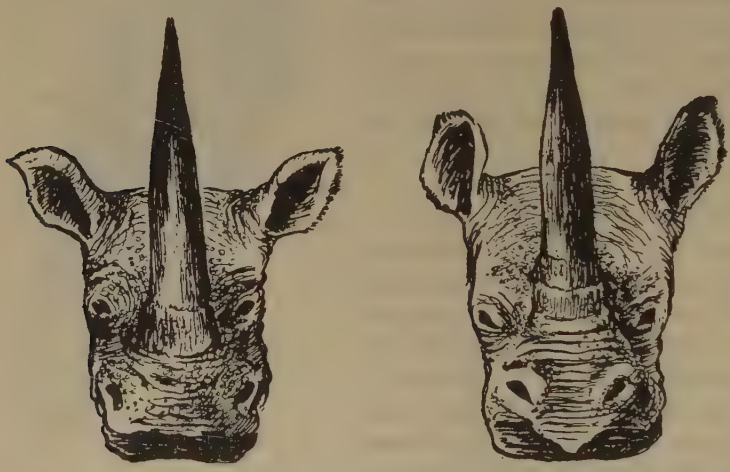
Strange though it may seem, it was not until 1898 that white men first heard of the largest carnivore in the world, the huge brown bear of Kamchatka, Manchuria and the Sakhalin islands (*Ursus beringianus*). There is another very similar variety on the other side of the Bering Straits—the Alaskan Kodiak bear. It has been given various names, among them *Ursus middendorffi*, for the systematics of the bears in this part of the world is abominably confused. But we are not concerned with the name; the point is that it was not until the end of the last century that science knew that there were monstrous brown bears 10 feet long and weighing more than 1,600 pounds. Until then the largest bear was thought to be the grizzly (*Ursus horribilis*), which is considerably smaller, hardly more than 6 feet 6 inches long and never weighing much more than 1,100 pounds.

It was likewise not until 1900 that a variety of the second largest land animal was found to exist in part of the world where it had been quite unknown. The beast was the white rhinoceros [1] (*Ceratotherium simum*),

[1] Actually the white rhinoceros is the same greyish hue as the black rhinoceros. It has been said that its name is merely due to its habit of rolling in pools and in the dust, covering it with a crust of dried mud which protects it from insect-bites and gives it a bloom of white dust. The so-called black rhinoceros lives in the forest, and so keeps its natural colour. In reality the misnomer arises from a mistranslation of the Boer name for the beast, which is *weid* rhino. This comes

which had been thought to be confined to South Africa south of the Zambezi. It is 15 feet long, more than 6 feet high and may weigh more than 2 tons. Its longer horn may be 5 feet 2 inches high, the height of a small man. It is the most impressive of all the rhinoceroses.

Then Captain A. St H. Gibbons brought a white rhinoceros skull from Lado on the Upper Nile, some 2,000 miles farther north than the



13. The white rhinoceros (*left*) differs from the black rhinoceros (*right*) in having a shorter and broader upper lip.

area in which it had hitherto been found. Other specimens were collected by Major Powell-Cotton, enabling the great Lydekker to describe it as a new geographical race or sub-species of the white rhinoceros (*Ceratotherium simum cottoni*). Its area of distribution stretches from north-east of the Uele into the Belgian Congo. That such a huge beast could have remained unnoticed in a country generally thought to be well-explored seemed almost like a joke.

The next discovery was of the largest known ape, the mountain gorilla. Its existence was established in 1901, and two years later Matschie christened it *Gorilla beringei* in honour of Captain Oscar von Beringe, who brought the first skin back from Kivu on the eastern side of the Belgian Congo. Until then only one species of gorilla was known (*Gorilla gorilla*), whose habitat stretched from Gabon to the

from the Dutch *wijd*, which means "wide"—not "white"—and refers to its broad, square nose; for the essential difference between the two species is in the shape of the upper lip and the distance between the nostrils.

Cameroons and the French Congo. Yet as early as 1860 the natives of Rumanika in Ruanda (adjacent to Kivu) had told Speke of a monster which hugged women so savagely that they died. The negroes in the east of the Belgian Congo had always been full of tales about what was

14. Mountain gorilla.

called *ngagi* in Kiniaruanda and *ngila* in Kiswaheli and Kingwana. But even though the whites had known the Gabon gorilla for some 40 years, they refused to believe these "absurd legends" until Beringe killed the first specimen.

The Kivu gorilla is certainly a fearsome beast. It may be as much as 6 feet 6 inches high—taller than the coastal gorilla, which has never

been known to exceed 5 feet 11 inches. An old male with its arms outstretched can sometimes span more than 9 feet, its chest measurement being 67 inches and its biceps 25 inches. Its weight may be as much as 600 and possibly 700 pounds. That such a huge brute could remain unknown until the beginning of the twentieth century shows what a shy and pacific beast it really is.

But the greatest sensation of the 1900s was the okapi. As Dr Maurice Burton has said: one can have no idea today of "the romance surrounding the discovery of the Okapi, nor of the excitement caused in natural history circles, first by the vague reports of its presence, and later by its actual finding."

The first evidence of the okapi's existence was extremely slender, and consisted of no more than three lines in H. M. Stanley's *In Darkest Africa*, published in 1860. In his linguistic notes he remarks of the Wambutti pygmies in the Ituri forests of the Congo:

> The Wambutti knew a donkey and called it "atti." They say that they sometimes catch them in pits. What they can find to eat is a wonder. They eat leaves.

There was no reason to doubt Stanley's statement, journalist though he was, but no one had ever heard of wild asses in the Belgian Congo. The only Equidae known there were zebras, but these specifically running beasts never lived in forests, certainly not in the thick jungle inhabited by the shy pygmies. So the experts were sceptical.

All the same, Sir Harry Johnston, then Governor of Uganda, was intrigued by Stanley's remarks and decided to gather more information about the *atti* on his visits to the Congo. He had an unusually good opportunity at the end of 1899, when he saved a party of pygmies from being carried off by a German showman to be exhibited as curiosities at the 1900 Paris Exhibition. They were his guests in Uganda for several months until he could take them back to their native forests. Meanwhile they became firm friends and Sir Harry was able to question them through an interpreter about the horse-like animal which lived in their forests.

> They at once understood what I meant; and pointing to a zebra-skin and a live mule, they informed me that the creature in question, which was called OKAPI, was like a mule with zebra stripes on it.

Okapi or *o-api* is evidently the name that Stanley mistook for *atti*.

When Sir Harry arrived in Fort Mbeni in the Congo Free State, he questioned the Belgian officers stationed there and learnt that though

they had never seen the animal alive, their native troops hunted it in the forest and killed it with spears. They brought back the meat to add to the fort's provisions and cut up the skin into strips to make belts and bandoliers. One of the officers said that there should be a new skin somewhere in the fort, but Sir Harry was bitterly disappointed to find that it had already been cut into pieces, and he was able to salvage only two of them.

On 21 August 1900 he wrote a memorable letter to Dr Sclater of the Zoological Society of London telling of this partial success of his investigations. He said that the precious strips of skin would be sent off at once and that the Belgian officers had promised to get him a complete skin and send it to him in Uganda.

> All this time [Sir Harry remarks] I was convinced that I was on the track of a species of horse; and therefore when the natives showed the tracks of a cloven-footed animal like the eland, and told us these were the foot-prints of the okapi, I disbelieved them, and imagined that we were merely following a forest-eland.

Sir Harry was very wrong to disbelieve the natives. Had Dr Sclater known that the beast had cloven hooves he would have been saved from making a bloomer. When he received the strips of skin he hastily christened the beast *Equus johnstoni*, though he cautiously added a question mark after the generic name *Equus*.

Meanwhile Karl Eriksson, a Swedish officer in the Belgian service, sent Sir Harry a whole skin of an okapi and two skulls. The skin and one of the skulls had come from a young male. Gradually a picture of the beast was built up from the pygmies' descriptions and the anatomical specimens. It was an odd animal—reminiscent of those mythical monsters made up of bits from different creatures. It was as big as a medium-sized horse, a little like a giant antelope in shape, but without visible horns; on the other hand it had a long tongue like an anteater's and ears as big if not bigger than a donkey's; its thighs and hindquarters were covered with stripes. Because of this last detail alone it had been taken for a new species of zebra. Actually, as Sir Harry wrote:

> Upon receiving this skin, I saw at once what the okapi was—namely, a close relation of the giraffe.

The shape of the skull, the structure of the teeth, the ruminant's cloven hoof are all evidence that it is a sort of short-necked giraffe, a creature related to its long-extinct ancestors, a cousin, no doubt, of the

Helladotherium whose remains Albert Gaudry had disinterred from Miocene deposits in Greece.

Sir Harry sent his new trophies to Professor Ray Lankester in London suggesting that it should be called *Helladotherium tigrinum*. But Lankester was better versed in comparative anatomy, and came to the conclusion that the okapi was closer to the giraffe than to the *Helladotherium*, almost half-way between the two, and that it deserved a genus of its own no less than Sir Harry deserved the credit for discovering it. He therefore named it *Okapia johnstoni*.

It was soon noticed that, unlike the quite hornless *Helladotherium* but like the giraffe, the male okapi had little miniature horns hidden under the skin, making a bump on the forehead. It undoubtedly belongs to a vast group of primitive Giraffidae (such as the *Helladotherium*, *Samotherium*, *Palaeotragus*, *Sivatherium* and so on) which flourished in Africa and Asia in the Miocene and even more in the Pliocene.

As soon as the okapi's existence—which most people had doubted—was firmly established, everyone began trying to prove that it had been known for thousands of years. Archaeologists and Egyptologists kept thinking they had found its features in Neolithic rock-carvings in the Sahara and on predynastic Egyptian painted vases or bas-reliefs dating from the Pharaohs. Sometimes there is indeed a striking resemblance.

15. This mural drawing at Oued el Djerat in the central Sahara, shows that about 3000 B.C. the Egyptians knew an animal similar to the okapi.

In 1935 R. Perret pointed out three pictures of animals very like okapis among those carved on the side of a wadi called Oued el Djerat between Fort-Polignac and Djanet in the Tassili-n-Ajjer. There is no doubt that if the animal illustrated in Fig. 15 is not an okapi it is very closely related to it. Professor Léonce Joleaud thinks it is a *Libytherium*, which lived in the savannah in Egypt and the Sahara and became extinct when it vanished several thousand years ago. Meanwhile the okapi was better protected in the virgin forests of the Semliki and the Ituri and survived in peace until today, proving, as the water-chevrotain did, that the African rain-forest is the perfect habitat for preserving creatures from a past age.

When Sir Harry Johnston came home from Uganda he met Stanley in England. Naturally they discussed the new animal they had both helped to discover. Stanley told him that he thought that the okapi was only one of the many animals that would eventually be discovered in the tropical rain-forest and said that he had seen a huge hog 6 feet long and some antelopes of a quite unknown type.

After the harvest of new species reaped by zoologists during the last few decades the atmosphere was optimistic. The okapi had shown that the natives' tales could be trusted, and people took an eager interest in the rumours which had been current for a quarter of a century about a sort of monstrous wild boar in the Ituri forests. This *senge* was said to be a fierce beast as black as the night and as big as a rhinoceros—or, at least, as a little rhinoceros. Stanley's evidence lent weight to this legend.

In 1904 Captain R. Meinertzhagen of the British East Africa Rifles happened to acquire a skin of the beast. It had come from the forests around Mount Kenya and was unfortunately in a poor condition. A little later the same officer obtained a skull of the same animal, which this time had been shot in the forests bordering Lake Victoria. This enabled Oldfield Thomas to give a scientific description of this particular *senge* and christen it *Hylochoerus meinertzhageni*, or "Meinertzhagen's forest-hog."

It is true that it was nowhere near the size of a rhinoceros—even a small one; all the same it was the largest of wild boars, since it may reach a height of 4 feet at the shoulder and a length of over 8 feet. It is also the blackest boar ever seen and its tusks are long and massive.

16. Head of the giant forest-hog.

This monster was no sooner added to the zoological catalogue than a similar-looking beast was rumoured to live in the other end of the equatorial forest. The up-country natives in Liberia claimed that a large black pig called *nigbve* lived in the forests of this area. As early as 1668 Dr Dapper had noted in his compilation, *Naukeurige Beschryvinge der Afrikaensche gewesten van Egypten*, that in the *Greyn Kust*, or Pepper Coast, which is now Liberia,

> There are two sorts of swine, the red called *Couja*, which are the size of our own, and the black called *Couja Quinta* which are much larger and more dangerous; for they have teeth so sharp that they break everything they bite as if they were so many axes.

The *Couja* is evidently the red river-hog (*Potamochoerus porcus*). As to the black pig, some suggested that it was not a giant forest-hog at all, but one of those pygmy hippopotami reported from the same area so long before.[1] To which it was objected that the *nigbve* was a forest animal, whereas the hippopotamus was by definition aquatic, and the pygmy hippopotamus's survival had by no means been established.

Carl Hagenbeck, the great German animal-dealer, decided to get to the bottom of the confusion and sent his agent, Hans Schomburgk, out to Liberia in 1909. The expedition got off to a bad start. The natives insisted that the *nigbve* was such a very fierce beast, with teeth sharp enough to cut a man in two, that they stoutly refused to help Schomburgk, whom they thought was mad to want to capture such a monster. Nevertheless he eventually managed to persuade them, and on 13 June 1911, after months of searching, he came upon the creature 10 yards away in the forest. It was a shiny black and did look like a big pig, but it was obviously related to a hippopotamus. Unfortunately Schomburgk—who was the first white man to see a pygmy hippopotamus in its natural surroundings—had no means ready to catch it and had scruples about shooting an animal which was thought to be extinct and was certainly very rare.

Back in Monrovia no one believed his story: the *nigbve* was a mere superstition, or at best a legend based on a long-extinct animal. Schomburgk could do nothing. The rainy season was setting in, and he had to return to Hamburg empty-handed. But now he knew he was not hunting a myth, and by Christmas 1912 he was in Liberia again. This time he was luckier. On 28 February 1913, having made sure that the species was

[1] In spite of what immediately follows, I am by no means convinced that the *Couja Quinta* is a pygmy hippopotamus, for the giant forest-hog was later found also to live in Liberia.

much less rare than he had thought, he shot the first specimen. The next day he managed to capture one alive and found that though its teeth looked unpleasant it was actually much easier to tame than an ordinary hippopotamus. Besides being smaller it was much less heavy in outline, had smaller jaws in proportion and was blacker and shinier. Moreover it was a forest animal which went into the water only occasionally to drink or bathe. Leidy had been right in putting it into a new genus, *Choeropsis*, since the word *Hippopotamus*, or "river-horse," does not describe its anatomy or its habits. The name "pygmy hippopotamus" may be superficially descriptive, if only as a comparison and an indication of relationship. An okapi could as well be called a pygmy giraffe.

Five months later Hans Schomburgk confounded the sceptics by bringing back five live pygmy hippopotami to Hamburg. These little beasts weighed one-tenth of the weight of a true hippopotamus. An adult male was no more than 2 feet 6 inches high and 5 feet 10 inches long.

It is little over half a century since the largest of the bears and the largest of the apes were discovered and the largest rhinoceros was found to exist in a country where it had been quite unknown. The largest of the lizards was not discovered until 1912, when an airman made a forced landing on Komodo, an island 20 miles long by 12 miles wide between Sumbawa and Flores in the Lesser Sundas in the Malay archipelago. The only men who lived there were convicts deported by the Rajah of Sumbawa. The airman came back with a tale that he had met fierce and monstrous dragons, at least 12 feet long, which according to the inhabitants ate pigs, goats and deer and even attacked horses. Needless to say nobody believed a word of his story.

But soon afterwards the existence of these giant reptiles was confirmed by Major P. A. Ouwens, curator of the Botanical Gardens at Buitenzorg. He had been corresponding with J. K. H. van Steyn van Hensbroek, the Civil Administrator of Flores, about them since December 1910. The islanders had told this official that around Laboean Badjo, on their own territory, and on the neighbouring island of Komodo, there was a *boeaja darat*, or "land crocodile." Van Steyn was interested, and promised to find out more about the beast and even obtain a specimen at the first opportunity. When his duties took him to Komodo he learnt from Kock and Aldegon, stationed on the island with the pearl-fishing fleet, that the lizards were sometimes over 20 feet long. Aldegon boasted

that he had killed several of this size. But fishermen are proverbially unreliable judges of size.

Van Steyn was more modest. During his stay he obtained the skin of a specimen 7 feet long and sent it with a photograph to Major Ouwens, saying that he would try to catch a bigger one, but it would not be easy, since the natives were terribly afraid of its teeth and its thrashing tail.

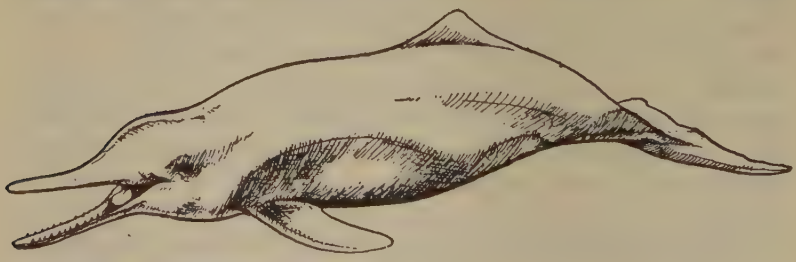
The Zoological Museum at Buitenzorg sent a Malay animal-catcher to van Steyn, who had the bad luck to be posted to Timor, so he missed the first successful capture. Rajah Ritara lent his hunters and dogs to the animal-catcher, who managed to bring back four specimens alive, the largest being 9 feet 6 inches and 7 feet 8 inches long. A little later, according to van Steyn, a Sergeant Beker shot one 12 feet long.

Major Ouwens at once recognised that these monstrous prehistoric-looking lizards were a giant species of monitor lizard. He described it under the name of *Varanus komodoensis* in the Bulletin of the Buitenzorg Botanical Gardens.

When the Komodo dragon was better known it was found that it was only rarely dangerous to man. All the same it is a fearsome-looking beast which certainly kills and eats buffaloes, wild pigs and deer. It is now to be seen in several zoos, where you have only to watch at feeding time to witness its extraordinary gluttony, which may perhaps explain why, although *Komodo* means "rat island," there is not a single rat there now.

Later it was found that the dragon also lived on the small islands of Rintja and Padar at the eastern end of Flores, and that the Bima archives had expressly mentioned its existence in 1840, when the Rajah of Sumbawa had taken steps to protect the monster from extinction.

While we are in the East I should mention in passing that in 1918 a freshwater dolphin of a quite unknown genus was discovered in Lake Tung-Ting, 650 miles from the mouth of the Yangtze Kiang. It was



17. *Lipotes vexillifer*, the freshwater dolphin of Lake Tung-Ting.

all white, 8 feet long and had a long beak. The local name was *pei-ch'i*, meaning "white flag," an allusion to the dorsal fin, which the American zoologist Gerrit S. Miller retained in its Latin name, *Lipotes vexillifer*.

Meanwhile there were plenty of zoological discoveries still to come from Africa. In 1908 Lydekker described a new species of spiral-horned antelope from Abyssinia, the mountain nyala (*Strepsiceros buxtoni*). More interesting from our point of view were the pygmy gorilla and pygmy chimpanzee.

The American zoologist Daniel Giraud Elliot described the pygmy gorilla in his monumental three-volume monograph on the primates in 1913. His description of *Pseudogorilla mayema* is based solely on a few skeletons and skins from the delta of the Ncomi and the Rembo near the mouth of the Ogowe south of Fernan Vaz. Even its appearance is still little known. Its coat is dark grey, except on the head and shoulders, where it is a slightly reddish chestnut. The male rarely exceeds 4 feet 6 inches—the height of a female chimpanzee—while the two subspecies of large gorilla may be as high as 6 feet and 6 feet 6 inches.

After forty years we are still waiting for further and more detailed news of this "pygmy giant ape," which apparently has never been seen alive except by the hunters who provided the skins and skeletons, no doubt by shooting the beast the moment they saw it. Yet, strange to say, the existence of this species about which we know so little has never been doubted, although the pygmy elephant, which is much better known, has been so bitterly disputed that I have had to treat it as an unknown animal in a later chapter in this book.

The pygmy chimpanzee was discovered in a museum, of all places! In 1925 Ernst Schwartz examined the skins and skeletons sent to the Congo Museum at Tervueren in Belgium from the country between the left bank of the River Congo and its tributary, the Kasai, he realised that there must be a new and quite distinct variety of chimpanzee. The pygmy species is thinner, its limbs are slenderer; its bones are all more delicate (the skeleton weighs only half of that of the ordinary chimpanzee, *Pan troglodytes*) and it is shorter by 15 per cent. Its face and ears are quite black from birth, except around the mouth—like a music-hall coon—while the other chimpanzees are born light and darken with age.

Later the pygmy chimpanzee was observed in its native forest, and Professor Urbain of the Vincennes Museum and Zoo brought a live specimen from the French Congo, on the *right* bank of the river. Though every care was taken it lived only for a year, from 1939 to 1940,

in the Vincennes Zoo. A few specimens can now be seen in the zoo at Antwerp.

Another no less sensational discovery was made in the same way—and in the very same museum. It is true that the animal was not one of the large quadrupeds with which we have been refuting Cuvier, but merely a bird the size of a pheasant. However, since it also comes from the equatorial forests of Africa, still so full of surprises, and since the discovery of a quite unknown genus of bird is almost unheard of, the story deserves to be told here.

In 1909, while Schomburgk was on the pygmy hippopotamus's track in Liberia, an expedition was organised by the New York Zoological Society in order to bring back a live okapi to the Bronx Zoo: Herbert Lang and his young disciple Dr James P. Chapin took part in it. The attempt failed. But they did not return quite empty-handed. When Lang and Chapin got home they found that the tall native head-dresses they had brought back from Avakubi as curiosities included two reddish feathers striped with black, which none of the experts could identify.

The problem remained unsolved until 1936, when Chapin happened to recognise some similar feathers on two stuffed birds, thrown out among the lumber in the Tervueren Museum. At first he did not believe his eyes, especially as one of the birds was labelled "*Pavo cristatus*, juvenile, imported." All the same he had no difficulty in proving that it was not a common peacock, but a hitherto unknown genus of Congo peacock which he named *Afropavo congensis* and described in the *Revue de Zoologie et de Botanique Africaines* for November 1936. It was the first unknown genus of bird discovered for more than 40 years.

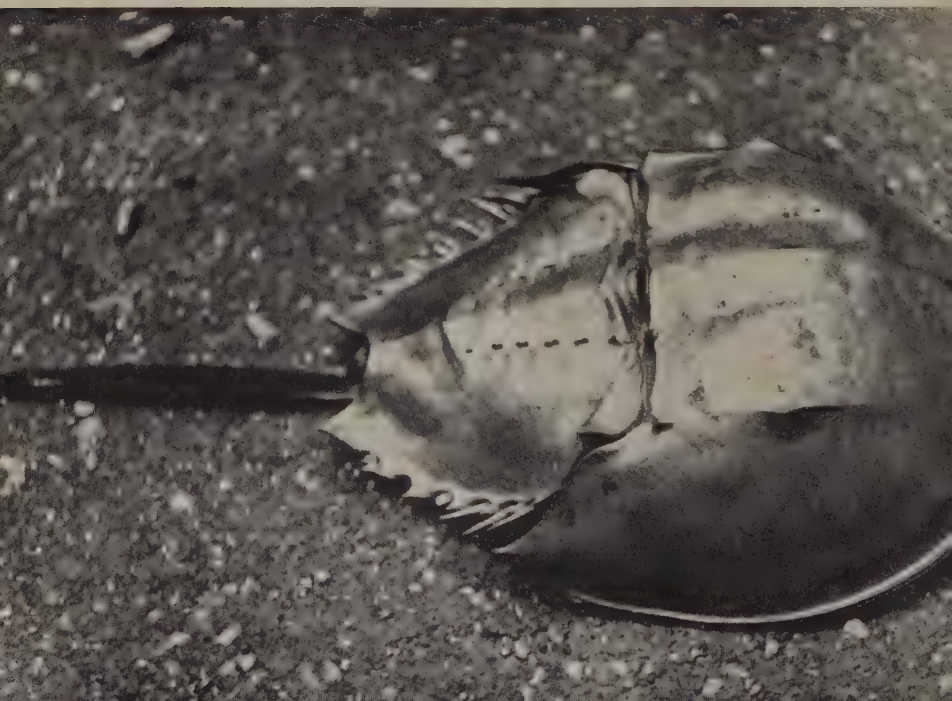
Chapin could not wait to capture a living specimen. On 19 June 1937 he flew to Stanleyville in the Belgian Congo, where he found that the news of his discovery had gone before him and no less than eight specimens had been shot and were waiting for him. He was astonished to learn from the natives in the forests of the Ituri (the site of so many discoveries) that though the Congo peacock had a restricted habitat it was very common in the vast stretch of country between the Ituri and the Sankuru.

This was the sixth species of largish animal to be discovered in the equatorial rain-forests of Africa in less than 50 years, and it was not the last. In 1919 Glover Allen discovered near a stream in the darkest part of the Ituri forest a genet of aquatic habits which lives on fish. It is the size of a domestic cat with a splendid chestnut coat, marked with white

The Andean wolf (*left*), compared with the wolf of the pampas (*right*), was described from a single skin in 1949.

This spider belongs to a group 300 million years old.

The horseshoe- or king-crab has not altered since the days of the great dinosaurs.



18. Congo peacock (after Frechkop, 1947).

spots on its face, and with a thick black bushy tail. This is all we know about it. No one has ever found any specimens since. The natives had apparently never even heard of it and so it has no local name. In English it is generally called water-civet, in Latin *Osbornictis piscivora*.

1929 takes us back to China, where Father David's *bei-shung* had been vainly searched for since 1870. It is true that Dr Weigold of the first German expedition to south-west Tibet had seen one in 1915. He had even kept a young specimen, given him by the natives, for several days, but it died for lack of proper food. The black-and-white "bear" was on the point of being considered an extinct species when two sons of President Teddy Roosevelt—Colonel Theodore Roosevelt and his brother Kermit—saw one dozing in the top of a hollow pine-tree. A salvo of shots pitched the poor brute into its last sleep, and its stuffed skin was soon being admired in the Field Museum at Chicago.

This did not prevent further slaughter. Dr Ernst Schaefer shot one in 1931, Dean Sage, Jr, and W. G. Sheldon in 1934, Captain Brocklehurst in 1935 and Quentin Young in 1936. By now it was quite clear that Alphonse Milne-Edwards had been quite right in thinking that the *bei-shung* was not a bear but closely related to the panda and also ate bamboo shoots. So it came to be called the giant panda—a name still unfamiliar to the public—with odd results. When William Harkness announced to the Press that he was off to Szechwan to catch a giant panda and bring it back alive, the teleprinter-operator misunderstood him. Next morning most of the newspapers reported that he was going to China in quest of a "giant panther"—and another unknown animal was born!

In 1936 Floyd T. Smith succeeded in catching the first giant panda alive, but it died at Singapore. That same year Harkness died suddenly in Shanghai before he had a chance to catch his panda. But his widow was determined to carry on his task and set off on the panda's track in 1937. She knew next to nothing about the animal, and still less about China, and for months she searched the jungle with extraordinary pertinacity. She had the luck she deserved, and, where the most experienced explorers had failed for 70 years, she succeeded. One day she found a baby panda in a hollow tree. It was crying as if its heart was fit to break. She picked up this child of her husband's dreams and nursed it in her arms. It survived a delirious welcome to the United States, but in the Brooksfield Zoo at Chicago it swallowed a branch too gluttonously and died in March 1938. The second time Mrs Harkness was luckier. She brought back another female giant panda, called Mei-mei, who settled happily in her new home.

Soon there were toy pandas in the nursery and pandas in the comic strips, but for the zoologist the problem had only begun, for no one knew how this apparent carnivore which ate nothing but bamboo-shoots should be classified. Eventually the great American expert William King Gregory, agreeing with Alphonse Milne-Edwards's opinion, put it in the Procyonidae along with the raccoons, the coatis, the kinkajou and various other purely American animals. Dr Frechkop has since suggested that the pandas and the kinkajou alone should form a family of Ailuridae of their own, which would fall between the bears and the cats. Other writers have gone on classing the giant panda with the bears, and the recent serological work by Leone and Wiens supports their view. Perhaps Father David was right after all in thinking he had brought back the skin of a bear.

The last great zoological discovery in Asia aroused bitter controversy.

The inhabitants of Cambodia have long known that in clearings in the forests in the north of the country there is a wild ox which is neither the gaur (*Bos* (*Bibos*) *gaurus*) nor the banteng (*Bos* (*Bibos*) *banteng*). It is called *kou-prey*, or grey ox.

It had been reported by Dr Dufossé in 1930 and R. Vittoz in 1933, when Professor Achille Urbain, director of the Vincennes Zoo, went to Indo-China in 1937. There he saw some handsome horns of this beast among the trophies of a veterinary surgeon called Dr R. Sauvel who lived in northern Cambodia, and he persuaded him to try to catch a live specimen. Sauvel succeeded in doing so—a young male which was sent off to Vincennes Zoo post haste. He also enabled the professor to examine an adult male which he had just shot near Chep. Whereupon Urbain promptly named the beast *Bos* (*Bibos*) *sauveli*.

> They grey ox [he wrote] is an animal which differs from the banteng in its greater height, for some specimens reach 6 feet 3 inches. Moreover its coat, which is entirely grey in juveniles and females, is a fine matt black in the old bulls with lighter patches on the shoulders and the rump. These animals have a very marked dewlap and four long light grey "stockings." The horns are cylindrical and widely spread; they are curved forward in the male, and lyre-shaped in the female.

At their last curve the male's horns always have a cuff of hairlike, shredded horn-fibres. These characteristically frayed and worn horn-tips seem to be due to the bull *kou-prey*'s habit of butting its horns into termite-heaps, presumably to sharpen them. Unlike the other wild oxen in the area, the *kou-prey* has only a slight dorsal ridge. The gaur reaches the same height, but has no dewlap. The gayal, the third Asiatic ox in the sub-genus *Bibos*, is probably a domesticated or half-domesticated variety of gaur, which it much resembles. It has a dewlap, but only a slight one.

It was after the scientific description had been published that the trouble arose. The Cambodians, when questioned, said there were *two* kinds of unknown ox in the north of the country, the *kou-prey* and the *kou-proh*. The first had whitish horns, while in the second they were greyish green and curved more inwards. Then it turned out that the *kou-prey* was merely the *kou-proh*'s calf. A more damaging aspersion was that the *kou-prey* (or *kou-proh*) was often seen mixed with herds of banteng. Might it not therefore be a hybrid of a banteng with some other ox? Other naturalists even suggested that it was a hybrid between a half-domesticated gaur and one of the wild species.

Naturalists, it seems, will invent anything to avoid admitting that a new large animal has been discovered. None of this criticism was justified. Professor Urbain had watched a whole herd of *kou-prey* near the borders of Cambodia and Laos. And the minute anatomical study which Harold Jefferson Coolidge made in 1940 showed that the *kou-prey* was so different from the other Asiatic oxen that he thought it should be put in a new genus, *Novibos*; but I think this is going too far.

The last great zoological acquisition, the Andean wolf, is known only from one skin. Today it is in exactly the same position that the pygmy hippopotamus and the giant panda were in at the end of the last century, half way between a myth and a real animal; there are palpable remains, but there is still bitter controversy about the creature's identity.

In 1926 Lorenz Hagenbeck, the famous German animal-dealer who carried on his father Carl's business, happened to buy in Buenos Aires the skin of a large and quite original-looking canine animal which was said to come from the Andes. The skin was sent to Germany, where it was passed from museum to museum, ending up in Munich. In 1940 it came into the hands of Dr Ingo Krumbiegel, who agreed with Professor Krieg that it was a mountain species of the maned wolf. But he did not dare to undertake a description of it on the evidence of only one skin; for with the Canidae you never know whether it may not be a mongrel offspring of some unusual cross. No zoologist could survive the blow if his new species turned out to be a cur from the gutter.

Dr Krumbiegel shelved the matter until 1947, when he learnt from Lorenz Hagenbeck that when he bought the skin he saw three others exactly similar to it. There was therefore little danger that they were hybrids, especially as the skins had so many peculiarities.

Dr Krumbiegel then related this skin to a skull which he had examined many years before and which had come from a group of specimens collected in the Andes. At that time he had thought that it could only belong to a maned wolf from southern Brazil, Paraguay and the Argentine (*Chrysocyon jubatus*), which the Indians call *aquara quazu* or "big fox," [1] although it measured a little more than 12 inches, while the average of twenty maned wolves was a little less than 10 inches. It therefore probably belonged to the same species of Andean wolf as

[1] The maned wolf looks like a tall fox, and I have always thought it has been mistakenly put among the dogs and wolves (*Canis*), when it is in every respect like the foxes (*Vulpes*). Dr Frechkop tells me that he examined the specimen that recently died at Antwerp Zoo and found that its pupil was slightly oval, which confirms my suspicions and the justice of its Indian name.

Hagenbeck's skin. And on these two pieces of evidence Dr Krumbiegel published a first summary description of what he called *Oreocyon hagenbecki*, "Hagenbeck's mountain-dog." As usual, *Oreocyon* turned out to have been used to describe a fossil, so he altered it to *Dasycyon* or "thick-furred dog."

Dr Krumbiegel's unwearying attempts at reconstructing the animal from a single skin eventually resulted in some excellent drawings, which are reproduced here facing page 64, and clearly show how much the Andean wolf differs from the maned wolf of the pampas. Its blackish-brown fur is not only darker but also much thicker; the hairs on the back are 8 inches long. The legs are shorter and more solid, and the claws are more powerful. The ears are smaller and rounder; and the jaws are a little heavier and stronger. It is clear at once that one is an animal of a cold climate and that the other runs on the plains.

These differences are so marked that Dr Krumbiegel has provisionally put the Andean wolf in a new genus, though one day its skeleton, the pads of its feet and other details of its anatomy may show that it is merely a new species of *Chrysocyon*. The question will not be finally settled until we have further and more complete specimens.

But in fact the fauna of the Andes is so little known that it looks as if it will be many years before the question of the mountain wolf is solved.

There should be no need to refute Cuvier's dictum any further. The world's zoos can boast of the Indian tapir, Cotton's white rhinoceros, Grévy's zebra and Przewalski's horse, of Schomburgk's and Père David's deer, the okapi, the water-chevrotain, the pygmy hippopotamus the Assam takin, the gerenuk, dibatag and a host of other new deer and antelopes, the *kou-prey*, the giant panda, the gelada, both lowlands and mountain gorillas, the giant siamang and the pygmy chimpanzee, the snub-nosed monkey, the Kodiak bear, the monkey-eating eagle, the Congo peacock and even the Komodo dragon. In our museums there are stuffed skins of the giant forest-hog, the pygmy gorilla, the white dolphin of Tung-Ting, the water-civet, and the Andean wolf, and no doubt the skins of many unknown animals besides.

The lesson should have sunk in by now, yet there are some zoologists who will never learn. In 1934 Dr C. Anderson of the Australian Museum could still write:

> Although there are many kinds of land animals yet to be discovered and described, they are mostly of small size, and it is safe to say that there is no mammal, bird, or reptile of large dimensions and unusual

structure which is entirely unknown, and which would not fall naturally into some well recognized group.

What can I say? I must leave him to be dealt with by the zoologist who in 50 years' time compiles the list of the great zoological acquisitions of the second half of the twentieth century.

SUMMARY OF GEOLOGICAL PERIODS

Era	Period	Millions of years since the beginning of the period (approximate)	Animal activity
Quaternary	Recent	—	—
	Pleistocene	1	Man appears
Tertiary	Pliocene	15	The mammals multiply and expand
	Miocene	35	
	Oligocene	45	
	Eocene	60	Rise of the mammals
Mesozoic	Cretaceous	140	Collapse of the reptile empire
	Jurassic	170	First birds, peak of the reptile empire
	Triassic	195	First mammals, decline of the amphibians
Palaeozoic	Permian	220	Amphibian empire
	Carboniferous	275	First reptiles and insects
	Devonian	320	First amphibians
	Silupian	350	Fish multiply
	Ordovician	420	First fish
	Cambrian	520	Reign of the marine invertebrates
Archaean	Pre-Cambrian	2,500	Single-celled animals and sponges

CHAPTER THREE

The Survivors from the Past

She liv'd alone, and few could know
When Lucy ceased to be . . .
WILLIAM WORDSWORTH
"She dwelt among th' untrodden ways".

WHAT is a "living fossil"? The term is not an insult, it merely shows surprise that such an anachronism in flesh and blood should still survive; and its exact meaning is relevant here since we shall often be concerned with the possible survival of animals universally thought to be extinct. For it is a fact that some animals still unknown to zoologists seem to be well known to the palaeontologist, though only in a fossil state. Yet many zoologists and most palaeontologists steadfastly refuse to admit that they can possibly survive, and their reason for doing so is all the more obscure since the world teems with "living fossils." What then is a "living fossil"?

Everyone has a general idea, but its exact meaning is hard to describe. One might reasonably say that it meant a creature that was still alive when it ought logically to be extinct, but this does not solve the problem. What logic condemns a creature to extinction?

For the man in the street "living fossils" are extraordinary-looking and very rare creatures which are confined to a strictly limited area and date from a vanished age. Yet, as likely as not, he washes himself in the morning with the skeleton of a sponge which has hardly altered since the Cambrian period at the beginning of the Palaeozoic era, hundreds of millions of years ago. And when there is an R in the month he may well eat mussels dating from the Triassic and oysters from the Jurassic. Nor are they necessarily so rare. The horseshoe- or king-crab (*Limulus*), which is actually more of a scorpion than a crustacean, existed as a genus in the Triassic and is still so common after nearly 200 million years that

its crushed body is used as fertiliser.[1] And in Lake Kyogo in the Belgian Congo there are fisheries which catch 4,000 tons of the Devonian lungfish *Protopterus* every year. Nor do you need to go to the ends of the world or dive into the sea to find a "living fossil" as old as the much-publicised Coelacanth. In your cellar there are probably dozens of "living fossils" from the Devonian and Carboniferous periods spinning their webs. The tarantulas in the lower red sandstone in Aberdeenshire are very like our modern spiders; likewise spiders of a modern type have been found in seams of coal in England, Bohemia, Silesia and Illinois. Nor need they be confined to a limited area. Australia, the kingdom of the monotremes and marsupials, is inhabited by no land animals which are not "living fossils." All the others have been imported by man.

19. The *Lingula*, a brachiopod, or lamp-shell, 400 million years old.

There is no doubt, however, that all "living fossils" do date from a vanished age. But in fact all the surviving groups of animals were born in the course of distant geological periods. The most recent of them, the mammals and the birds, arose during the Mesozoic era. And not a single completely new type of organism arose during the whole of the Tertiary era.

It therefore seems better to confine "living fossils" to those creatures which are among the few survivors of otherwise extinct groups, and ought "logically" to be extinct themselves. Yet from this point of view one might reasonably say that all the amphibians and all the reptiles are "living fossils" since there are now relatively few survivors of these once-flourishing groups. The amphibians ruled the earth in the Carboniferous and Permian periods but now they consist only of inconspicuous salamanders and newts, frogs and toads, and humble caecilians without legs.

In fact it is generally agreed to limit "living fossils" to very small groups of survivors which have perpetuated themselves throughout the

[1] For instance, half a million horseshoe-crabs were used for this purpose at Bowers in Delaware in 1927.

The barramunda, a lungfish from the Triassic period, caught in an Australian river in 1869.

Latimeria, a Coelacanth thought to be extinct for 70 million years, which was caught off the South African coast in 1938.

The tuatara of New Zealand, which springs from the end of the Palaeozoic era, often shares its burrow with a petrel.

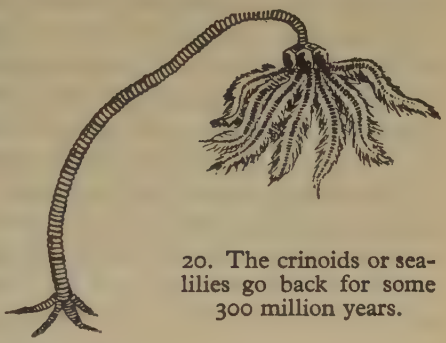
The crocodiles have hardly altered since the beginning of the Mesozoic era.

A "living fossil" that carries its age well: the giant tortoise of the Galapagos Islands, which has remained almost unchanged for 190 million years.

The hoatzin of the Amazon, whose chicks still have claws on their wings.

Fossil imprint of the Archaeopteryx, the reptile-bird of the Jurassic period, which had claws on its wings and also teeth.

ages while the larger groups have been undergoing vast changes and still giving birth to new types.[1] It is thus a relative term. For why should we deny it to a class (like the amphibians) when it is often applied to an order (like the tortoises and turtles or the crocodiles, which have hardly changed since the beginning of the Mesozoic era)?



20. The crinoids or sea-lilies go back for some 300 million years.

Other authors are more exclusive and include only those unique and solitary survivors of once-considerable groups; the pearly nautilus, for instance, that odd shelled cephalopod which lives 25 fathoms down in the Pacific and the Indian Ocean and, like the horseshoe-crab, has remained unaltered since the Silurian period in the middle of the Primary era; or the *Latimeria*, better known as the Coelacanth, that crossopterygian fish which comes straight out of the Devonian period; or, finally, the New Zealand tuatara (*Sphenodon punctatus*), the sole survivor of the order of Rhynchocephalia, which dates from the end of the Primary era, before the days of the giant dinosaurs. The tuatara is a large olive-green lizard, some 2 feet 3 inches long, which still has a vestige of a third eye on the top of its skull. This is called the pineal eye and is found in the higher vertebrates in the shape of the epiphysis or pituitary gland.

A recent addition to these lone wolves of evolution is the *Neopilina galathea*, which was first described in 1957 by Dr Anton Bruun without benefit of sensational newspaper headlines. Yet from a zoological point of view it is even more extraordinary than the Coelacanth. It is a small mollusc like a limpet which the Danish oceanographic vessel *Galathea*

[1] The layman may be glad of a reminder of the main lines of the zoological hierarchy. The animal kingdom is divided up into phyla, each phylum into classes, each class into orders, each order into families, each family into genera, each genus into species. For instance man belongs to the phylum of vertebrates, the class of mammals, the order of primates, the family Hominidae, genus *Homo*, species *sapiens*.

These divisions are sometimes further subdivided or grouped into sub-orders, super-families or infra-classes—and every conceivable sub-, super- and infra—but when carried to extremes this only creates more confusion. It is well to remember that in nature there are only individuals, and that all these man-made categories are purely arbitrary and are invented to clarify our knowledge not to obscure it.

fished up off Costa Rica in 1951. When carefully examined in the laboratory it proved to be the sole representative of a whole class which had been extinct since the Palaeozoic era, the Monoplacophorans. *Neopilina* is the missing link between the chitons (Polyplacophorans or segmented molluscs) and the most primitive of the Gastropoda, the Patellids or cone-shaped shells, that is to say the limpets. As Professor Roger L. Batten, who now teaches invertebrate palaeontology at the University of Wisconsin, has shown, this discovery has meant that the classification of the molluscs has had to be completely rearranged.

The size of the "once-considerable group" is also relative. There are many families of animals which now consist of only one genus, yet no one would call them "living fossils." On the other hand, to admit nothing but sole survivors would exclude such authentic examples as

21. The tuatara of New Zealand is older than the great dinosaurs.

the brachiopods or lamp-shells, aberrant worms which imitate clams and of which there are still 59 genera today, and the Crinoids or sea-lilies, those graceful echinoderms attached like plants to the bottom of the sea, of which there are now 12 surviving genera. Though they are by no means sole survivors, they are all that is left of two groups which once spread all over the earth and have remained quite unchanged for 300 and 500 million years respectively.

This brings us to a new idea, that "living fossils" can be defined as *stationary* species. There are quite a number of types of animal whose evolution seems to have stopped long ago, for their structure has not altered appreciably since distant ages. Admittedly it is not always easy to say for certain that an organism has not changed for millions of years, for our knowledge of past creatures is often slender and based on no more than a shell, a skeleton or a mere impression in the mud. We

cannot be sure that the flesh which has perished has not undergone any change in its physiology or cellular structure. A creature could develop a means of regulating its temperature, poison-glands, lungs; its kidneys could alter, and it could perfect its heart, the circulation of its blood and the delicate balance of its endocrine glands, increase the complexity of its sensory and motor organs and the co-ordination of its nervous system: all these important changes could take place and leave next to no mark on the animal's solid remains. So we must be cautious.

Thus we can at last define "living fossils" as creatures that belong to an ancient type of organism which has survived until today without undergoing any great anatomical change. We may even grant the name

22. The young hoatzin still has claws on its wings.

to creatures which have preserved a set of important and archaic characteristics, though they would be "living fossils" only in respect of these particular features.

The hoatzin (*Opisthocomus hoatzin*) of the Amazon is a good example of this. When fully grown it looks ordinary enough, like a sort of crested pheasant, yellowish in colour with an olive back and dull red belly. But the young bird still has well-developed claws on the first two fingers of its wings, thus betraying its distant origin. When hoatzin chicks use their clawed wings to climb branches, crawl on the ground or swim after tadpoles, they look just like little reptiles, and remind one irresistibly of the Archaeopteryx, the reptile-bird of the Jurassic, when birds had teeth. The hoatzin has also preserved other significant archaic features. It does not cry like a bird, but croaks like a frog and gives off a strong smell of

musk like a crocodile and some of the turtles. To deny that it is a "living fossil" would be absurd.

The fact of the matter is that there are "living fossils" surviving from all past ages. The oldest are the radiolarians, unicellular creatures with a flinty shell convoluted like a filigree jewel, remains of which have been found in Pre-Cambrian strata, that is to say they date from 2,000 million years ago, before the beginning of the Palaeozoic era. But the most recent are not the least interesting. The opossums, the very rare West Indian almiqui (*Solenodon*), the armadillos, the spectral tarsier and the tapir all date from the Eocene, almost 70 million years ago. The shrews, the pangolins and many of the monkeys in the Old World are relics of the Oligocene. The hedgehogs, the okapi and the aardvark come from the Miocene, and so on.

In all justice we should admit that there are not only genera of "living fossils" like the pearly nautilus, the horseshoe-crab, the tuatara and *Neopilina*, but also families of them like the kiwis and the opossums, orders like the phyllopod crustaceans, the scorpions and the monotremes or egg-laying mammals, classes like the sea-cucumbers, the sea-lilies, the chitons, those still-segmented molluscs, the peripatus or worm-insects and fish with legs or lungs like the coelacanths and lungfish,[1] and even whole phyla, like the brachiopods.

The point I have been trying to make in discussing all these "living fossils" is that there is no creature, however "primitive," which could not have survived until today, and that in fact we find lingering examples of most of the groups which once flourished on the earth.

Yet the mere suggestion that a dinosaur, a flying reptile or an ape-man might survive will exasperate most scientists. These creatures, they say, have been completely extinct for a long time, the argument being that their fossil remains have not been found in geological strata later than some remote period.

This is to rely unduly on the hazards of fossilisation. The conditions necessary to ensure that a body is fossilised, that it is preserved from scavengers of all kinds and from the destructive effects of air and water, occur only once in a thousand million times. Generally it is some exceptional accident that produces them; the animal falls into a salt lake

[1] There are three existing genera of lungfish of the group of Dipneusta which flourished in the middle of the Primary era, especially in the Devonian period, some 300 million years ago. The best-known is the barramunda (*Neoceratodus forsteri*), a cylindrical fish almost 5 feet long which was not discovered until 1869 in a river in Queensland. The others are the African *Protopterus*, of which there are four different species, and the South American *Lepidosiren*.

or a frozen marsh that never thaws again, is swallowed up in mud, a lake of pitch or a puddle of resin, or is suddenly smothered by an avalanche, a stream of lava or a sandstorm. The characteristic fossils of any geological stratum are therefore far more likely to belong to the commonest and most widespread groups of animals of the corresponding period, to the species with a virtually indestructible shell or carapace

23. Reconstruction of the Archaeopteryx.

and also to the most vulnerable species, that is to say the slowest and least intelligent. This may be why we have so little physical evidence about the past history of apes and man.

. The absence of fossils of a certain type in a geological stratum may mean that the type was not common at the time, or that it had no hard parts (or no very hard parts, as in the toothless mammals), or that it was nimble and cautious enough to escape accidents that might cause fossilisation, or merely that it had the good luck to escape any such

accidents. It is the first alternative that interests us. Since we still have a great deal to learn about the world's living fauna (as is proved every year by the discovery of new species, whose habitat is sometimes limited to areas not easily accessible), it follows that we know next to nothing about the animals of the past which were not widespread, and of which we have but a few rare fossils.

To show where the line should be drawn between a common species and one that is not widespread, I would say that the common land animals today are man and his domestic animals, a lot of rodents and bats, a good many birds and vast numbers of insects and small molluscs. All the other animals—most of the mammals, in fact—can be considered as rare and on the road to extinction.

Moreover, as Professor Caullery has pointed out, "even those organisms which are fossilised do not all reach us, by a long way. Many of them subsequently disappear as a result of a series of accidents; strata fold and laminate, change shape, dissolve and are eroded." And he adds:

> Finally, if we consider the fossils which have actually survived until our time, we must not overlook the fact that we can reach only an extremely small proportion of them. A large part of the sedimentary formations is today submerged beneath the seas and is thus quite inaccessible to us. Of the sediments on the dry land of our continents, we can normally examine only the outcrops, that is to say an infinitesimally small part.

The late Professor Leon Bertin of the Paris Museum, whose vast learning gave him a broad and comprehensive outlook, stated quite categorically, "In palaeontology negative evidence means nothing." There are any number of groups of animals which must have existed at certain times, although not the slightest trace of them has been found in the corresponding strata. And while fossils are occasionally found where they have been deduced to be, they are more apt not to be there.

The *Latimeria chalumnae* which was fished up in a drag-net off the South African coast on 22 December 1938 is a striking proof of this. The group of Crossopterygia, which gave birth to this large fish with lobed fins at the same time as it spawned the main body of land vertebrates, had been extinct since the end of the Primary era, some 200 million years ago. Remains of some members of the Coelacanth family have been found in the Jurassic, and a single one, *Macropoma*, at the end of the Mesozoic era. But for some 70 million years there have been

no more. Nor did the tuatara appear from nowhere, yet no trace has been found of any rhynchocephalian in strata less than 135 million years old. The *Neopilina* belongs to a group which had been thought to be extinct for 280 million years. There could be no better proof of the limitations of palaeontology.

The refusal of many zoologists to consider that certain fossils could have survived seems to be due to a traditional attitude rather than to legitimate scepticism—and this is all the more absurd since the attitude is founded on naïve and ancient notions which have long been rejected.

When it was first shown that fossils were not just freaks of nature, but the actual remains of long-dead animals, this discovery had to be made to agree with what happened in Genesis. This led to the theory that the ancient fauna had been destroyed by universal disasters, the last of which was Noah's flood. Cuvier's mind was too commonplace and dogmatic to admit anything which would disagree with the letter of the Scriptures, so he invented his famous theory of the Revolutions of the Globe. Each of his supposed periodical disasters must have been followed by a new creation, at least if one is to account for the appearance of new forms—or so his pupil Alcide d'Orbigny concluded, reckoning that twenty-seven successive creations were necessary to explain all the known fossils.

Poor d'Orbigny is still ridiculed, but he was the only upholder of the Revolutions of the Globe whose theories were perfectly consistent. Cuvier was more hypocritical. "I do not pretend," he said, "that there had to be a new creation to produce the existing species: I only say that they used not to exist in the places where they are now seen, and that they must have come there from elsewhere."

I have never understood how any sensible man could be taken in by this absurd explanation. For it implies that originally the fauna on the earth was rich and diversified in the extreme, and that it included all the species that have ever existed. After each almost universal disaster the earth would have been repopulated by the species that had escaped destruction and thus the world's fauna would have been gradually impoverished.

This theory completely disagrees with the facts of palaeontology which the Father of that Science had taken such pains to learn. The deeper the geological strata the less varied the forms of life: there are no birds below the Jurassic, no mammals below the Triassic, no reptiles

below the Carboniferous, no amphibians below the Devonian, no fish below the Ordovician, and in the Pre-Cambrian there are nothing but sponges and the most primitive invertebrate creatures. Far from becoming impoverished, the fauna has continually become richer with the passage of time.

Moreover Cuvier's explanation explicitly contradicts his own theories, for he maintained that man could not have been contemporary with the so-called antediluvian animals. But if man did not exist at the beginning of time and has not descended from more bestial creatures, where on earth did he come from? "From elsewhere," replied Cuvier, without the courage of his religious and philosophical opinions, and all the world cried Amen.

Cuvier's baneful influence was felt for a long time and had the worst consequences. In 1854 the Torquay Natural History Society refused to publish a note about some palaeontological discoveries, even though they were confirmed by three reliable witnesses, because of its "lack of probability." Some tools of worked stone had been found with the remains of extinct animals.

In 1860 the Académie des Sciences at Paris used the same pretext to refuse to publish Edouard Lartet's note on the geological antiquity of the human species in western Europe. He was obliged to have it published in Switzerland and in England, where it was received with enthusiasm. Not long after the great Boucher de Perthes died, his family, who were horrified by his heretical opinions (for he too believed that man was contemporary with extinct animals), had his works withdrawn from sale and sent them to be pulped.

We may smile at this ludicrous behaviour, but even today (and for the same reasons, which have now become more or less unconscious) many scientific journals refuse to publish any contribution, however seriously documented, that deals with the possible survival of certain species which date from a past age.

It is not so easy to be rid of doctrines forcibly imposed. When the Theory of Evolution won the day, it was at first naïvely interpreted by minds loath to disturb the old dogmas too suddenly. There was no longer the notion of a discontinuous series of fauna, but of a continuous chain, with the corollary that every ancient species could be considered as the direct ancestors of its more recent relatives. This principle implied that the existing lizards of today were descendants of the dinosaurs of the Secondary era. Hence it followed that an animal that belonged to one age could not be found in a subsequent one, for it was constantly alter-

ing. Thus there was a new reason for automatically ruling out the survival of archaic forms.

Latterly the notion of "living fossils" has become more familiar, and the evolutionary tree is seen to be not a straight bamboo of successive stages, but a complex of almost parallel branches bursting occasionally into bushes of twigs.

A truly original type is never the outcome of a high degree of specialisation. It does not spring from the end of one of the twigs of the last bush, representing the previous group to burst out in sudden expansion. It always derives from a flexible, unspecialised type on the stem of the bush. After an uneventful evolution, and inconspicuous because it is usually small, commonplace and of unspecialised habits, the type that is trying to find its way eventually comes upon the most favourable conditions and then gives birth with almost explosive suddenness to a host of very varied forms, making a bush on the family tree. Meanwhile another humble and inconspicuous scion leaves the base of the bush, one day to burst into another new group. And so on.

Thus each new form evolves parallel to the older forms, but is a little behindhand. The various groups in the animal family tree are joined only at the base. The animal empires do not take turns at ruling the earth. They encroach upon one another and destroy one another when they are both competing for the same habitat. "Living fossils" are creatures which have escaped these massacres, either because they have never found opponents of their own size, or, as more often happens, because their territory has not yet been disputed or has only just begun to be conquered.

For this reason we can expect to find them chiefly in the remotest corners of the earth: islands, high mountains, underground caves, virgin forests, swamps and deserts.

In the previous two chapters I have shown that the earth may still hold plenty of large unknown animals and that in fact the zoological catalogue is constantly being added to. We now know that among the future zoological discoveries there may well be animals that are known but thought to be extinct.

The history of the discovery of an unknown animal almost always follows the same pattern. At first it is utterly unknown to the Western world. Then, by questioning the natives, travellers or merchants first come to hear of its existence. There is not a single example of a large

animal which has remained quite unnoticed by the people who live nearest its habitat.[1] The local descriptions of the beast are often only roughly accurate and exaggerated in some respects. Sometimes the animal is said to have supernatural powers. Nevertheless the different versions of the story, even those told by tribes far removed from one another, agree so well that they eventually arouse the interest of a few naturalists. Finally white hunters' or prospectors' tales confirm the native legends. But not until the animal is brought back, dead or alive, do the sceptics admit the evidence. There is only one variation in this pattern. Sometimes the animal described by the natives is thought to be a fossil by the Western world, and its bones, or even its mummified hide, appears in palaeontological collections.

If we want to have an idea of the still unknown animals that may be discovered in the future, our best plan is determined by this fixed pattern of events. First we should listen carefully to the native tales, picking out the details that agree in accounts from different sources. Then we should try to see whether this description fits any species in the local fossil or sub-fossil fauna, that is to say one that is thought to be recently extinct. Actually, when it is a species that is supposedly very recently extinct we shall have to be particularly careful since it is possible that the animal's description has been handed down by tradition from ancient times. All the same we should remember that van Gennep, who has made a very thorough study of the process by which legends are formed, considers that "the memory of a historical fact does not continue among communities *which do not use a written language* for more than five or six generations, that is to say for 150 years on the average, and 200 years at the most." It therefore takes only two centuries to corrupt or wipe out the memory of historical facts or events among peoples whose traditions are purely oral. This knowledge will be most useful to us.

The reader may be surprised at the trust I generally put in the evidence of what are somewhat condescendingly called "primitive" peoples. But because their conception of the world is utterly different from ours there is no need to say that they are all liars.

Hyatt Verrill, the American explorer, has affirmed that during his long experience of primitive tribes he had always found that even the most fantastic and incredible traditions always had an origin in fact, for primitive man was incapable of inventing such stories and making up such monsters in their entirety.

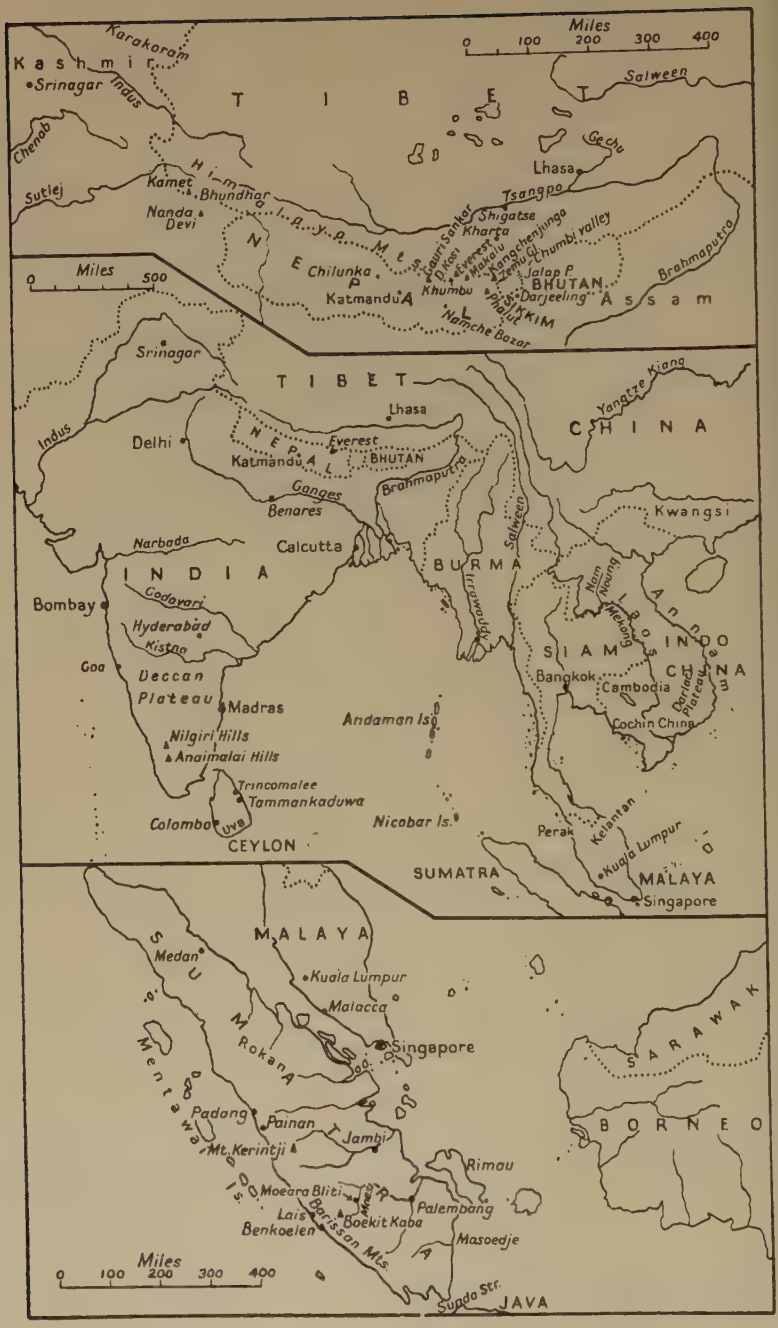
[1] The water-civet, though small and amphibious, and therefore inconspicuous, may perhaps be taken as the exception which proves this rule.

Westerners are much more severe on the metaphors and similes of primitive peoples than they are on their fellow-countrymen's tales. They do not mind if you say that after walking through a fog you could "cut with a knife" you saw an animal with an "interminable" tail which made off "like lightning." But if some Australian blackfellow tells them of a "devilish worm" that "spits fire" and which it is "death to look at," they shrug their shoulders and will have no more of it, when they ought to realise that this merely means that the blackfellows know of an animal that is worm-like (or snake-like, it comes to the same thing), has a forked tongue like a flame and which it is wise to avoid as its bite is fatal.

Part Two

THE MAN-FACED ANIMALS OF SOUTH-EAST ASIA

And there be mungrell and ambiguous shapes,
between a humane and a brutish Nature.
MONTAIGNE, *An Apology of Raymond Sebond.*


Miles
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Karakoram
Kashmir
Srinagar
Indus
TIBET
Salween
Chenab
Gechu
Lhasa
Sutlej
Kamet
Bhundhar
Himalaya Mts.
Tsangpo
Nanda Devi
Shigatse
Kharta
Kangchenjunga
Chumbi valley
Everest
Makalu
Lhotse Ch.
Jalap P.
Chilunka P.
Katmandu
Khumbu
BHUTAN
Darjeeling
Assam
Brahmaputra
Sikkim
Namche Bazar
Miles
0 500
Srinagar
TIBET
Yangtze Kiang
Lhasa
Indus
Delhi
CHINA
Everest
NEPAL
Katmandu
BHUTAN
Brahmaputra R.
Ganges
Benares
Kwangsi
Narbada
Calcutta
Salween
BURMA
INDIA
Irrawaddy
Nam Hoang
Bombay
Godavari
Mekong
Laos
Hyderabad
Kistna
SIAM
INDO CHINA
Goa
Deccan Plateau
Bangkok
Cambodia
Madras
Annam Plateau
Andaman Isl.
Cochin China
Nilgiri Hills
Anaimalai Hills
Trincomalee
Tammankaduwa
Colombo
Uva
Nicobar Is.
CEYLON
Perak
Kelantan
SUMATRA
Kuala Lumpur
MALAYA
Singapore
MALAYA
Medan
Kuala Lumpur
Malacca
SUMATRA
Singapore
Rokan R.
Mentawai Is.
Padang
Painan
Jambi
Mt. Kerintji
SARAWAK
BORNEO
Rimau
Moeara Bliti
Palembang
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Boekit Kaba
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JAVA

CHAPTER FOUR

Nittaewo, the Lost People of Ceylon

> . . . that Pigmean Race
> Beyond the *Indian* Mount, or Faerie Elves,
> Whose midnight Revels, by a Forrest side.
> Or Fountain some belated Peasant sees,
> Or dreams he sees.
>
> JOHN MILTON, *Paradise Lost.*

IT may seem odd that the first unknown animals to be investigated should be described as "people." But from India to the Malay archipelago we shall constantly run up against the same question about the mysterious creatures reported to live there: are they men or beasts?

Asia may still hide unknown apes whose mental development is higher than that of the anthropoid apes and thus comes close to our own. Or it may be inhabited by men more primitive than the Australian Aborigines, the Veddahs or the African Bushmen, and still at the Neanderthal stage. Or yet again, a few survivors of those strange ape-men, the Java Man and the Pekin Man, may linger on today not far from the places where their bones were found.

The slightest evidence about the anatomy, physiology, genetics, relationship, habits or mentality of creatures to which we may be closely related would be of enormous value. Whether they are "sub-men" or "super-beasts," we should learn much if we could meet creatures which showed, even if distantly, what we had once been, or were descendants of our rivals which were once near to exterminating us and which we may hardly have exterminated.

The first place in which "beast-men" are reported to have survived into historic times is India. Pliny the Elder wrote at the very beginning of the Christian era:

> *Duris* maketh report, That certaine Indians engender with beasts, of which generation are bred certaine monstrous mungrels, halfe beasts and halfe men.

We can pass over the fanciful and salacious theory of their origin for the moment and still admit the report of monstrous half-men and half-beasts. They need not have been cross-breeds. The Greek historian Duris of Samos also mentions a whole race of "human beasts" on the banks of the Ganges called Calinges and all born with tails.

How far are Pliny's second-hand reports to be credited? He mingles the wildest fables with the most exact and careful observation. But it is unjust to laugh at his credulity. His work of natural history is a patient compilation of all the available evidence. And when it is evidence about the Mediterranean world he is by no means uncritical in his judgment. For instance, he strongly attacks the Greeks' fertile imagination and explodes more than one of their myths. He could not verify everything he reported—especially when it came from a distant land. And distant lands were as strange and little-known to him as Mars and Venus are to us. Besides, Pliny has often had the last laugh. Several "ridiculous fables" in his *Natural History* have been chuckled over for centuries, only to be proved true in the end. It is not very scientific to dismiss evidence because it seems unlikely or fantastic. There are thousands of "marvels of nature" which common sense would reject out of hand.

Let us look at the sources on which the account quoted by Pliny is certainly based: Ctesias and Megasthenes of the fourth and third centuries B.C. They were, as far as we know, the first western writers to speak of the Indies.

Ctesias, a Greek, was physician to Artaxerxes II, King of Persia. When he returned from the east he wrote a book about Persia, and then a second about India, although he had not been there. It was based entirely upon rumours that he heard in Persia and on reports from travellers. His original work is lost, but fortunately many extracts appear in the *Myriobiblon*, or Book of Wonders, of Photius, Patriarch of Constantinople in the ninth century. It includes the first known mention of pygmies in the east, whose existence was not admitted by science until 1887 as a result of work by the great French anthropologist Quatrefages de Bréau.

> In the middle of India there are black men called Pygmies. They speak the same language as the Indians and are very small. The largest are only two cubits high; most of them are only one and a half. Their hair is very long; it reaches to their knees and even further. They have a bigger beard than any other men; when it is fully grown they cease to wear clothing, but bind it round with a girdle and so make it serve for a garment. They are snub-nosed and ugly.

This description, though far from exact in its details, would cause no surprise today. The existence of oriental pygmies or Negritos is firmly established. But the Negritos are much larger than Ctesias's pygmies. 1½ to 2 cubits is about 2 feet 6 inches to 3 feet. In fact the smallest men known in Asia, the Tapiros of New Guinea, discovered only in 1910, vary between 4 and 5 feet high, most of them being about 4 feet 9 inches.[1]

There is good reason to believe that the Negritos once inhabited the whole of the south-eastern corner of Asia and probably Burma and Indo-China. During the last Ice Age the sea-level dropped slightly, joining the Philippines and the Andaman Islands to the mainland, and some of these people reached these islands on foot. They could not have reached them by sea, for some of them have still not learnt to build canoes and use the crudest of rafts to cross rivers, while others, like the Andamanese, who do build them, never venture far from the coast. When the sea-level eventually rose again the Andaman pygmies and the Aetas of the Philippines were saved from extermination by being cut off from the mainland, where a larger race mercilessly drove the little black men before them until today there are only a few isolated groups at the tip of the Malay peninsula. These are the Semang, and there are hardly 2,000 of them altogether.

24. Typical Negrito, an Aeta from the Philippines.

The Negritos of the Malay peninsula, the Andamans and the Philippines are still all one race although they have been cut off for so long. Sir Hugh Clifford, who lived with the Semang for some time at the end of the last century, described them as "like African Negroes seen through the reverse end of a field glass." Hence their name, which was given to them by the Spaniards who landed on the Philippines in 1521 and brought back reports of little black men which were disputed for several centuries.

The Negritos vary in colour from dark chocolate to sooty black. The hair on their heads is short and woolly in tight curls like astrakhan. The rest of their bodies is practically hairless. The skull is slightly

[1] And these are not true Negritos; they are more like pygmy Papuans.

brachycephalic, face very round, forehead narrow and rounded, and chin receding. The lips are fairly thick. The rounded fleshy part of the upper lip is very characteristic. The nose is broad and flattened with very distended nostrils. Their limbs are well proportioned, but their feet are large and clumsy and turned inwards a little. The Aetas exaggerate this with a very splayed big toe.

The Negritos live almost naked. Hidden in thick jungle they live in family groups on what they can catch and only rarely cultivate the soil. They eat yams and other wild roots, fish, sun-dried monkey-flesh and animals of all kinds. Usually they have no fixed dwelling, camping wherever the game is most abundant. They shelter in makeshift huts of palm-leaves spread casually over clumsy posts. Their habits are still incredibly primitive. The Andaman islanders do not even know how to make fire, they merely keep alight a flame originally lit from a still-active volcano on the neighbouring Barren Island.

The Semang have long been exposed to the Malay slavers and have never known the security which isolation had given their island brothers. Certainly they are the shyest of all. Their sharp senses usually enable them to disappear before the intruder arrives, but if one does come upon them, they manage to escape by climbing very nimbly up into a tree. The whole family moves from tree to tree by means of hastily rigged ropes of rattan. In their habits the Semang would seem to be the nearest men to the monkeys. The Malays call them *orang utan* or "men of the woods," a word which we confusingly use for the reddish-brown anthropoid ape from Sumatra and Borneo.[1]

But to return to Ctesias. His description hardly seems to fit the Negritos. There are no pygmies of this race in India now, and their short and curly hair does not agree with the long mane which Ctesias gives his pygmies. There is another much better identification which I shall come to soon.

When Ctesias wrote of the odd races of India he did not only mention pygmies. He also speaks of men with a more animal appearance.

> In the hills there are men who have a dog's head, and whose clothes are the skins of wild beasts. They have no language; they bark like dogs and so make themselves understood to one another. Their teeth

[1] In 1641 Nikolaas Tulp, a Dutchman, was probably the first European to apply the name "orang-utan" to an ape—it was a chimpanzee from Angola. What misunderstanding led him to use a Malay word for an African ape, which he gave the Latin name of *Satyrus indicus* (Indian satyr), is still a riddle. A few years later Jacob Bontius, another Dutchman, more wisely applied the name to the big reddish anthropoid ape from the Sunda islands.

are longer than those of dogs; their nails are like those of animals, but longer and more curved. They are black and very honest, like the rest of the Indians, with whom they trade; they understand the Indian language, but they cannot reply except by barking and making signs with their hands and fingers like deaf-mutes. The Indians call them Calystrians in their language, which means dog-headed. They live on raw meat. Their population may reach 120,000.

After mentioning that these dog-headed men live in caves and sleep on beds of leaves, that they use bows and spears and wear very fine tanned skins, he adds:

All of them, men and women, have a tail like a dog's, but longer and more hairy.

Shelving this tail for the moment (I shall have more to say about it later), let us pass on several centuries to Marco Polo, who also noted a race of dog-headed men in the island of Angaman (doubtless one of the Andaman islands). Did he refer to the Negritos? Perhaps. But perhaps his imagination had merely been influenced by tales in Pliny and Ctesias which were very popular in the Middle Ages.

Ctesias (who knew India only by hearsay) and Pliny (who quoted Ctesias, his Calinges are obviously the same as the Calystrians) may seem unreliable witnesses, but Megasthenes, an Ionian, must have been to the banks of the Ganges when ambassador from Seleucus Nicator to the court of King Chandragupta. One is therefore all the more surprised to find that he merely quotes Ctesias. But even this is not certain, since his work is known only by quoted fragments, and when Pliny reports what Ctesias and Megasthenes have said of the wonders of India it is sometimes difficult to tell who said what.

The problem of the Indian "beast-men" seemed to be solved in the year 400 when Bishop Palladius mentioned a race of strange pygmies in Ceylon, the Veddahs, one of the most primitive peoples in the world.

The Veddahs, who long ago took refuge in the mountains and forests of the eastern part of the island, are not strictly speaking pygmies, for their average height is not less than 5 feet. But they are barely an inch outside the limit. They are very different from the Negritos. Their skull is clearly dolichocephalic, their hair is long and wavy. Their skin is often lighter than the Negritos', though it is still very dark. They are not at all negroid. Their profile is remarkably orthognathous. Their lips are thin, their nostrils wide beneath a slender nose which is depressed a little at the root. Their most remarkable feature is their

receding forehead and strikingly heavy brow, beneath which their eyes seem very deep-set. Their beards are weak, and they have hardly any hair on their bodies.

Like the Negritos they are timid creatures, who run away from strangers. They live in separate families in caves or crude huts made of branches. Before the Sinhalese arrived they were still in the Stone Age, but since then they have used iron-headed arrows. The cult of spirits of the dead is their only religion.

25. Typical Veddah of Ceylon.

There is every reason to believe that this people, of which there are now only a few hundred pure-blooded survivors, once covered a vast territory. In India itself there are tribes with Veddah characteristics weakened by cross-breeding. These are known as the "jungle tribes" or "hill tribes" of the mountains west of the Deccan plateau, the Kadir of the Anaimalai hills and the Paniyan, Irula and Kurumba of the Nilgiri hills. Geologically the mountains of Ceylon are part of the same range and were cut off only after the Ice Age, when the Andaman Islands and the Philippines were separated from the mainland.

There is little doubt that the Veddahs are Ctesias's long-haired pygmies. Only the enormous beard and small size seem to be exaggerated—and there is also the long hairy tail. Probably the hill tribes have been confused with a monkey that also lives in the Western ghats, the wandereroo or lion-tailed monkey (*vetulus silenus*), a black macaque with a large grey mane like a prophet's hair and beard.

In the Malay peninsula there are also tribes similar to the Veddahs. These are the Sakai or Senoi—men of the jungle—a chiefly nomadic people. They wear no more than a bark loincloth and a fringe of stringy black fungi made into a girdle. They are armed with blow-pipes and

cultivate the ground with nothing better than a pointed stick. All the same they are in some respects more civilised than the Veddahs of Ceylon. They build villages of square or conical huts; they fear demons and sacrifice to gods, especially to Peng or Tuhan, the supreme being, and Grandmother Longpaps, the giantess who washes sinful souls in boiling water.

Louis Lapicque gave the name of Pre-Dravidians to these Veddah-like tribes, because they occupied the whole of India during the Ice Age before it was invaded by the black Dravidians, who in their turn were

26. The wanderoo or lion-tailed monkey.

invaded in about 1500 B.C. by the lighter-skinned Aryans. The yellow hordes of Genghis Khan broke over India in the thirteenth century, Tamburlane came in the fourteenth century and then Baber and Akbar in the sixteenth. These repeated tides have filled India with a mixture of many different races, and thus perhaps instigated the caste system.

The Veddahs were the poor relations in this motley world and were driven into the hills and cut off in Ceylon. Were they Pliny's "beast-men"? Could they have been the civilised monkeys described by the great traveller Ibn Batūta, who landed in Ceylon in the fourteenth century?

This apostle of Mahomet says of the monkeys in Ceylon:

> animals which are in great numbers in the mountains of these parts. These monkies are black, and have long tails: the beard of the males is like that of a man.

This description probably refers to the purple-faced langur of Ceylon (*Kasi vetulus*).[1] Its fur varies from silvery grey to jet black, and it has flowing white whiskers and a very long tail. But Ibn Batuta goes on:

> I was told by the Sheikh Othmān and his son, two pious and credible persons, that the monkies have a leader, whom they follow as if he were their king. About his head is tied a turban composed of the leaves of trees; and he reclines upon a staff. At his right and left hand are four monkies, with rods in their hands, all of which stand at his head whenever the leading monkey sits. His wives and children are daily brought in on these occasions, who sit down before him; then comes a number of monkeys, which sit and form a sort of assembly about him. One of the four monkeys then addresses them, and they disperse. After this each of them comes with a nut, a lemon, or some of the mountain fruit, which he throws down before the leader. He then eats, together with his wives, children, and the four principal monkeys; they then all disperse. One of the Jogees also told me, that he once saw the four monkeys standing in the presence of the leader, and beating another monkey with rods; after this they plucked off all his hair.

These monkeys can hardly be langurs. If the story is not a fable they must be more human creatures, though hardly so human as the Veddahs. They seem more like Pliny's "beast-men."

At the end of the nineteenth century new evidence lent weight to these ancient reports and showed that the Veddahs could not be the "beast-men," or, if they were, then there must be other even more beastlike men in Ceylon. In 1887 Hugh Nevill, a British explorer, was told a strange story by a Sinhalese hunter about a people called the *nittaewo* who agreed remarkably well with Pliny's description. The hunter had heard the story from a close friend, one of the last Veddahs in the Leanama region in the south-east of Ceylon. This old Veddah had been told by a relative called Koraleya a great deal about the *nittaewo* and their final extermination. They were a race of pygmies who inhabited the almost inaccessible mountains in the Leanama area which lay in the south of the Veddah country and extended from Bagura in the Panawa Pattu in the east to the confines of the Kattaragama hills in the west. There were also said to be *nittaewo* at Tammankaduwa.

[1] The local name is *wanderoo*, which has been applied in error to the continental species. The common specific name, *vetulus*, given to both these distantly-related monkeys, only increases the confusion.

If the *nittaewo* seemed savage pygmies to the Veddahs, who were themselves extremely primitive and quite small, they must have been remarkable creatures. They were said to be perfect human beings, but even smaller than the pygmies, being between 3 and 4 feet high; the females, as usual, were rather smaller. They walked upright and had no tail. Most accounts say that their legs at least were very hairy, but others give them thick reddish fur over most of their bodies; and, very rarely, they are described as hairless and dark in colour. All agree that they had remarkably short and strong arms. Their hands were also short, with long claws. They had no articulate language, and spoke with a sort of burbling, or birds' twittering understood only by a few Veddahs. They lived in small parties, sleeping in caves or on platforms of branches in trees covered with a roof of leaves. They fed on what they could catch: squirrels, small deer, tortoises and even lizards and crocodiles. They did not use arms. They ripped open their prey with their long claws and gluttonously devoured their entrails, a habit which disgusted the Veddahs, who disliked even more their habit of stealing meat that had been left to dry in the sun.

The Veddahs and the *nittaewo* were constant enemies. The little men had no defence against the Veddahs' bows and arrows, but they made up for it by mischief and cunning. When they found a Veddah asleep they would disembowel him with their claws. But the stronger and better-armed race won in the end. In the late eighteenth century, or so it would seem, the last *nittaewo* were rounded up by the Veddahs of Leanama and driven into a cave. The Veddahs then heaped brushwood in front of the entrance and set fire to it. The bonfire burnt for three days, and the trapped *nittaewo* were all suffocated.

Unfortunately all record of the cave's position was lost when the Veddahs of Leanama became extinct themselves a few generations later. It was the last of them who told Hugh Nevill's informant. We know that he got the story from his relative Koraleya, who heard tell of the end of the *nittaewo* when he was very young. Koraleya died in about 1870, which means that it must have been around 1800.

Hugh Nevill's report is, of course, based on information at fourth hand. One of the four links of the chain could have invented the whole story. But it was decisively corroborated at the beginning of this century when Frederick Lewis, who had never heard of Nevill's stories, explored eastern Uva and the Panawa Pattu district. At Salavai, he found one family who admitted that their grandfather was a real Veddah belonging to a clan from the confines of the River Kumbukkan. From the oldest

member of this family, who had adopted the Sinhalese name of Dissan Hamy, Lewis obtained a mass of information about the habits and customs of the Veddah people, and also of the pygmies, called "*Nittawo*," who used to harass them. According to this information the *nittaewo* had not been exterminated more than five generations earlier—Dissan Hamy's grandfather had taken an active part in burning out one of their encampments—and their appearance and habits agreed very closely with Nevill's version.

> I may here mention [remarked Frederick Lewis] that as I was sceptical as to the story about this race, I took particular care to make inquiries at the distant village of Waradeniyama (the furthest inhabited spot on the south of the Buttala-Wedirata) if the oldest inhabitant of that place could give me any confirmation of it. This inquiry was made when Dissan Hamy was not present, and it would have been impossible for my questions to have been anticipated. To my surprise, a very old man of the village completely confirmed in detail Dissan Hamy's description.
>
> I also made further inquiry at another village from a headman, and he repeated the same story, adding that the Nittawo were destroyed by the Veddas out of fear.
>
> It is difficult to reject as false a story, told devoid of the usual fantastic embellishments that characterize the history of mythical creatures, such as Yakko, when it is completely confirmed by parties ignorant of what the others have said. Even though tangible evidence is not forthcoming and it would be difficult to find any, of a people so primitive as these creatures appear to have been, I see no valid reason for disbelieving the statements made to me.

Moreover there is still an oral tradition among the Veddahs about the *nittaewo*. Quite recently Wilfred Mendis heard of them from a Sinhalese guide of Veddah extraction.

Accounts of the *nittaewo* by the Sinhalese, or even by the Veddahs, may well have given rise to ancient legends about "beast-men" in Ceylon. Frederick Lewis has shown that certain places on the south-east coast were used as ports of call by western navigators several centuries before Christ. In fact the River Kumbukkan, which runs right through this area, was well known at that time as a permanent supply of fresh water.

The existence of the *nittaewo* seems to be established without much doubt. It remains to be discovered what they were. The eminent expert on the primates, Professor W. C. Osman Hill, has set about this task with much patience and perspicacity. First, what does the name

nittaewo (sometimes spelt *nittavo*) mean? Nevill derives it from *nishâda*, the name given by the Aryan invaders to the more primitive tribes, citing *nishadiwa* or *nigadiwa* as the Sinhalese form which in Veddah would become *nittaewa* or *nittaewo*. But, Professor Hill writes:

> This suggests, quite apart from other evidence, that the Veddahs themselves are not synonymous with the *Nittaewo*, even though their mainland relatives would be included under the category of *Nishâda* and they themselves would also have been, had the invaders reached Ceylon.

But might not the *nittaewo* be Negritos, who are in fact slightly smaller than the Veddahs, though only by about 2 inches, and are in some respects even more primitive? R. L. Spittel favoured this theory in 1933. He pointed out that there were still primitive tribes of the Negrito type in southern India, especially the Kadars of the Nilgiri hills and that pure-blooded Negritos lived in the Andaman islands. India and Ceylon might therefore have been originally inhabited by Negritos of whom the *nittaewo* were the last survivors.[1] But Spittel is mistaken in thinking the Kadars (obviously the same as the Kadir) are of Negrito type. They are unquestionably nearer the Veddahs. All the same it is true that there are traces of cross-breeding with Negritos among the hill-tribes of India, and even among the Veddahs in Ceylon, particularly at Tammankaduwa. Moreover Professor Hill considers this very fact as a decisive proof that the *nittaewo* are not Negritos: since the Veddahs and *nittaewo* were perpetually at war it is not likely they would intermarry, as the Veddahs and Negritos do whenever they meet, for instance in the Malay peninsula where the Semang (Negritos) cross with the Sakai (Veddah type). Professor Hill also rightly points out that the Negritos do not look in the least like the description of the *nittaewo*.

If the *nittaewo* are not the most primitive of men perhaps they may

[1] As Aubrey Weinman has pointed out, there even seems to be concrete evidence of this:

> Most important evidence that pygmies must have lived in Ceylon in the prehistoric era is to be found in the small but extremely valuable collection of stone implements in the Colombo Museum, collected, I believe, by Mr C. Hartley, Principal of the Royal College for many years. In this collection there is a whole sequence ranging from bigger to smaller ones, and the latter are so minute in structure that they could only have been used by a race of pygmies who inhabited the island in the dim and distant past.

But I do not think that he is right in considering this a proof of the past existence of the *nittaewo*. These minute tools are evidence of true pygmies, not of the *nittaewo*, who, according to all traditions, did not use implements.

be anthropoid apes, the most advanced of the monkeys. When Jacob Bontius first described the orang-utan he added a legend that "the Javanese say that they are born of Indian women who couple with

27. Gibbon walking on its hind-legs.

monkeys under the influence of a vile sensuality." This shows that the tales Pliny reported were also told of anthropoid apes. But could the very detailed Veddah tradition have referred to an ape? According to Nevill the *nittaewo* has been compared to the orang-utan in at least one report. But this ape (see Fig. 48, p. 150) is too large, too heavy, too

strictly vegetarian and arboreal, and too solitary in its habits to agree with the description of the *nittaewo*.[1]

Actually the gibbon is a much better candidate. It is small: the largest species, the siamang of Sumatra (*Symphalangus syndactylus*), is 3 feet high when it stands upright—the same height as the *nittaewo*. It habitually walks upright on its hind-legs only, and it is the only ape that does so. It lives in troops. And it is not entirely vegetarian; besides insects it will eat birds and swallow their eggs. All this is a long way from the savage and bloody habits of the *nittaewo*, but the Veddahs may well have blackened the character of their greatest enemy, and according to Professor Hill a giant gibbon would make a very plausible *nittaewo*. It would have to be a species as yet unknown, for the siamang's fur is black and the other gibbons are black, grey, light fawn or brown—never reddish with long hairs. Moreover, gibbons are only found east of the Ganges and south of the Brahmaputra. It would be surprising to find them in Ceylon. But, of course, this is not a conclusive argument.

The theory that the *nittaewo* are not an anthropoid ape but an ordinary monkey without a tail really won't hold water. It is true that a pig-tailed langur (*Simias concolor*) has been discovered in the Malay archipelago, but only on the Mentawai Islands off the west coast of Sumatra, where there also lives a pygmy siamang (*Symphalangus* (*Brachytanites*) *klossi*) which fills the bill much better. Apart from its small tail this langur is quite unlike the *nittaewo*.

It has also been suggested that they were bears. Bears sometimes stand upright on their hind-legs and leave footprints very like those of human feet. The *nittaewo*'s hairy skin has also been compared to that of the only bear known in Ceylon, the Ceylon sloth-bear (*Melursus ursinus*). But there the comparison stops, for this bear rarely stands upright, its fur is black—though it sometimes turns red on the surface—it is not gregarious, and is carnivorous only in exceptional cases. It is well known to the Veddahs, who call it *aswail* and fear it because of the damage it does to beehives. According to Professor Hill the burbling, babbling language of the *nittaewo* might be made by bears, which lick and suck their paws noisily, sometimes for a quarter of an hour together, making a strange sing-song chirping as they do so. Thus they might be the origin of some of the stories about the *nittaewo*.

[1] There is a Sinhalese legend about very primitive creatures called *vanara*, or men-of-the-woods, corresponding to the Malay *orang utan*. Since the Malays used *orang utan* to describe the Semang Negritos, *vanara* may apply as well to the Veddahs as to the *nittaewo*.

But, according to Professor Hill, the most likely theory is still that the *nittaewo* were true ape-men, for the discovery of bones of the Pithecanthropus in Java and the very similar Sinanthropus in China, shows that ape-men (the morphological link between the anthropoid apes and man) once inhabited a large part of Asia and that they were no doubt driven into the Malay archipelago by more human invaders. They could have reached Ceylon when it was still attached to the mainland, and have then survived until very recently. It is clear enough that true ape-men (which according to some authors may have been giant gibbons that had given up living in trees) fit exactly with the Veddahs' description of the *nittaewo*.

I cannot quite understand why Professor Hill thinks that their small

28. The Ceylon sloth-bear (*Melursus ursinus*).

size helps to identify them with the Pithecanthropus—which was certainly much nearer our own, as is proved by the size of the skull and length of the femur. But it is very likely that if the Pithecanthropus was cut off in Ceylon it would develop into a pygmy race, as isolated species so often do.

But, you may say, since the *nittaewo* are extinct, we shall never be able to prove the truth of this theory.

This is not quite true. Systematic excavation in the Leanama region might bring to light bones of the *nittaewo* in a relatively fresh condition, and thus clinch the problem.

But surely there is no hope of ever examining one of these strange ape-men in flesh and blood?

Even this is not quite certain. For if the *nittaewo* are a vanished race in Ceylon there are other places in south-east Asia where hairy pygmies or "beast-men" are believed to exist.

Henri Maître, who explored the Moi hinterland of Cambodia, Cochin-China, Annam and Lower Laos at the beginning of the century, has shown how widespread such rumours are in Indo-China:

> Besides the two-horned rhinoceros which may very well be found there, the natives say Nam-Noung also shelters a more peculiar and certainly more legendary beast: I refer to the "wild men." It is not the first time that I have heard this curious legend of nomadic human creatures, living in mountainous forests, and having (according to the Moi) a tail like a monkey. They are almost unknown on the Darlac plateau where the gently undulating country is easy of access and covered with no more than grass and scrub, but were reported to me around the Great Lake and in all the hilly area of the Annam range. According to these local reports the "wild men" of Nam-Noung are small—less than five feet high—covered with a thick coat of reddish hair, and arms or legs which they cannot bend at all. The back of the forearm has a sharp membrane like the blade of a knife which they use for cutting away the bush to make a path through the forest. They cannot climb up trees, since they have neither knees nor elbows, so they sleep leaning against tree-trunks. They live on roots and stalks of plants, and do not know how to build huts, living the same wandering life as other beasts of the forest. The villagers used to run them down and eat them, but the "wild men" have become scarcer and are no longer found. But one sometimes still comes upon the footprints that they leave behind them, like those of other men, but smaller.
>
> This description of "wild men" is almost identical among all the villagers who believe in them, whether in the remote Nam-Noung district or in the heart of the Annam range. As I have already remarked they are almost unknown to the Radé of Central Darlac. One village on the plateau, however, not only knows them but even pretends to be directly descended from one of them named Kjhāt. Their habitat is near the village B. Mé-Nguol, a Radé-Kpa hamlet about a mile to the east of the Darlac Residence on the main Annam road.

The two striking details about these "wild men" are the tail—like Ctesias's dog-headed hill-people—and the strange anatomy of their forearms. Otherwise these russet pygmies agree well enough with the description of the *nittaewo*.

As to the tail, it seems to me significant that the Annamites used to allege that the Moi themselves had tails. The name Moi includes all the savage tribes inhabiting the mountains and plains of Annam and Laos. They are a mysterious race, of medium size (average height 5 feet

2 inches), with reddish tanned skins, the colour of a sunburnt European. They do not have slit eyes or prominent cheek-bones. Their noses are rather straight and they sometimes have fair or even reddish hair. Some authors have compared them to the Mediterranean race, with whom they may have been closely connected, for according to their traditions their ancestors came from a far country in the west. When the Moi became better known it was seen that they had tails no oftener than any other people,[1] on the contrary they attributed them to another race, more savage than themselves.

29. Man with a tail as a result of a rare atavistic freak.

But this does not mean that the "wild men" of Nam-Noung really have tails. A tail is simply a symbol of bestiality. It is not without reason that we give the Devil a tail. It is the Mark of the Beast. In which case it may seem odd that stories of men with tails should be especially frequent in an area inhabited by anthropoid apes (i.e. tailless monkeys), the gibbon and the orang-utan, proving that men are not the only bipeds without tails. On the other hand, if all the baser brethren of the higher apes have tails, it might seem logical to believe that any really primitive race of man would also bear tails.

Thus many modern commentators say that Ctesias's dog-headed people were the Lhopa of Bhutan, whom the Indians actually call Calystisi, or dog-faced men. There is nothing particularly primitive about these people, but the fact that they live in remote mountains is enough to make them seem very savage to those who live in the plains and on the coast. Hence their imaginary tail.

Henri Maître recalls that when the Cambridge Expedition embarked at Klang in 1899 on their way to Bangkok their Malay friends told them

[1] At the age of five weeks the human embryo normally has a well-formed caudal appendage. While an adult has 34 vertebrae, the embryo at this age has 38. Four or five at the end are later joined together to form the coccyx. But occasionally, by some freak of atavism, these vertebrae remain separate or even multiply to form a proper tail which may be as much as 4 or 5 inches long. Sometimes it is merely a fleshy appendage without bones, but when it is properly formed, with muscles and nerves, it can be moved like an animal's. It is usually bare but sometimes covered with hair. This malformation does not seem to be hereditary, nor is it commoner in some races than others, and it certainly could not be a characteristic of an entire people.

to be careful not to be eaten by the tailed savages—a monstrous slander on the refined Siamese. But then everyone thinks himself better than his neighbours and gives them beastly habits or animal appearance. Most of the ancient travellers gave tails to the savages they found, especially on islands. Marco Polo mentions men with tails in Sumatra. Gemelli-Careri finds them in Luzon, Jean Struys in Formosa, the Jesuit missionaries in Mindoro near Manila, Köping, a Swede, in the Nicobar Islands. And when Turner visited Tibet he was told of a race of men with tails living in the mountains. The tail was so stiff that they had to make a hole in the ground for it before they could sit down.

Jose Ribeiro, a missionary, lends tails to a tribe of American Indians called Mesayas. Louis Franck, a French doctor, reports from Africa that in the slave-trains "one can recognise cannibals by their little tail which the Ghellabis, or slave-dealers, cut off so that they will fetch a better price."

Even in Europe in the seventeenth century the Spaniards believed Jews had tails, in France the people of Béarn attributed them to the Cagots who lived at the foot of the Pyrenees, and in England the Devonians believed the same slander about their Cornish neighbours.

The legend of tailed men has been fostered by totemic tribes, who boast of their animal ancestry, and often therefore wear a false tail. The Niam-Niams wind the skin of a colobus monkey round their waists, letting the tail hang down behind. The Murut of Borneo do much the same, and so do the Australian Aborigines, who use skins of different animals according to their clan.

Every savage believes in someone more savage than himself. In their great work on the pagan races of the Malay Peninsula, Skeat and Blagden report the following Sakai legend:

> The "Orang Ekor," or Tailed Men, who are spoken of all over the Malay Archipelago as if they were real human beings, are described as appearing from time to time in various parts of the Malay Peninsula. They are said to resemble human beings, and are not believed to be dangerous; but they will have nothing to do with men, and vanish at once into the forest as soon as they are seen. They wear nothing but a loin-cloth of tree-bark, beneath which may be seen a short tail. Both the men and women have tails, but they are not numerous, and their children are never seen.

From what we have seen of legends of tailed men this may not necessarily mean that there are even more primitive men than the Sakai in the Malay jungle. Another Sakai legend reported by Skeat and Blagden

is more interesting from our point of view. It tells of a race of hairy pygmies, the *hantu Sakai* (demon Sakai) living in the lonely forests where they are very rarely seen. They are very timid and have such an extremely keen sense of smell that they can tell at once if a man is near and so escape from him. Their appearance and habits are like those of the *nittaewo*.

> These "demon Sakai" (Hantu Sakai) have a sharp blade-like bone in their right forearm which they use in the felling of trees. To gather the fruit from the topmost sprays of a tree they climb the stem, and seat themselves upon a branch, whilst they cut the spray through with this sharp blade. Although they fall to the ground together with the branch they never hurt themselves.

This reminds one of the cutting forearm of the "wild men" of Nam-Noung. Two explanations spring to mind. These blades are either a garbled allusion to the long forearms of the gibbon, which are indeed so long that they might well be mistaken for a normal arm lengthened by a sort of bill-hook; or they are actual knives such as certain jungle people use to hack a path through the forest, and carry so habitually that in the end they are mistaken for part of the body. The first explanation is hard to apply to the "wild men" of Nam-Noung, for they are said to be quite unable to climb trees, and the gibbon is of all the monkeys probably the most suited to living in trees, swinging gracefully from branch to branch and hardly coming to the ground except to drink. On the other hand, the Moi believe that the arm has no joint, and obviously if one thought a gibbon's forearm was a sort of bill-hook, the arm itself would be jointless. In Malacca there is a gibbon with white hands (*Hylobates lar*), and from a distance they might look silvery and be mistaken for a metal blade.

In fact a thorough study of the legends of the whole Indo-Malayan region shows that a great confusion reigns in the native mind between human races who live in the forest and the local apes, the orang-utans and various gibbons. This may be partly explained by the numerous successive invasions, both of animals and men, which this country has undergone. Some relics of these occupations have survived here and there on islands, in inaccessible mountains, and in jungles that are hard to penetrate.

In the Miocene period there were gibbons (*Pliopithecus*) even in Europe; in the Pliocene they came no farther west than Egypt (*Prohylobates*); and now they are found only in Asia east of the Ganges. Up till the Pleistocene period there were still orang-utans in China; now they

are confined to Borneo and Sumatra. Much the same thing seems to have happened to the Pithecanthropus except that none is supposed to have survived. Then came the tiny Negritos, who once occupied all Burma and Indo-China, and now survive only in the Malay peninsula, the Andaman Islands and the Philippines. They were followed by the little Veddahs, whose vast empire once stretched across India, but who now consist only of a few hill tribes on the Malabar coast, and have fled to the islands, where they are gradually dying out in their forest retreats in Ceylon, Sumatra and the Celebes, as well as in Malaya. All these little creatures have been beaten, massacred and driven out by larger and better-armed invaders. The struggle for existence is essentially fratricidal. Your bitterest enemies are those most like yourself and who want the things that you do.

Thus, in a series of tidal waves, India passed from the reign of the monkeys to the reign of modern man. The succession was not that of our family tree, for, though related, the invaders were not directly descended from one another. Nor was it a regular progress towards man. No doubt there were ups and downs. The battle went to the strongest, and the strongest is not necessarily the most intelligent. A race of gregarious monkeys—like the baboons—could easily conquer a country occupied by men living in scattered families. And even today there are places where man cannot conquer the insects.

But in the end the battle would always be won by a combination of intelligence, brute strength, ferocity and force of numbers.

The problem, then, is: to which of these waves of invaders did the *nittaewo*, the "wild men" and the "demon Sakai" belong? All these hairy pygmies seem to have preceded the Negritos and the Veddahs. But many of their habits and traits are not those of even the highest apes which lived there before the first men. Can they belong to the race of the Pithecanthropus which no doubt occupied the whole of south-east Asia at the end of the Pliocene period—that is to say in an intermediary age? They are too small to be the *Pithecanthropus erectus* of Java or the *Sinanthropus pekinensis* of China, which were the size of modern man. The Dutch palaeontologist von Koenigswald discovered in Java in 1939 and 1941 remains of the skulls of even larger ape-men which he called *Pithecanthropus robustus* and *Meganthropus palaeojavanicus*. If these creatures were proportioned like men—and this is pure surmise—the first would have been 6 feet 6 inches high and the second between 8 and 10 feet. Thus there are at all events considerable variations in the size

of the Pithecanthropus. It would not be at all odd if we also found a pygmy Pithecanthropus like the African Australopithecus. And if the *nittaewo* and their Malay and Indo-Chinese brothers really are creatures between men and apes, they must certainly be pygmy Pithecanthropi.

All this is based on a very slender scaffold of hypothesis. However, Professor Hill, who believes the *nittaewo* to be a Pithecanthropus, points out that in Sumatra there is a legend about an almost identical creature called the *orang pendek*. And this time it is not a case of vague and fantastic tales among primitive people—like the reports of the forest-demons with cutting arms. The *orang pendek* has been talked of since time immemorial. It has been seen by educated Malays and even by whites, and its description is therefore quite matter-of-fact. We shall pursue it more closely in the next chapter.

Meanwhile, before leaving for Sumatra, we must report another account of presumed ape-men. It was Christmas day, 1953, in a rubber plantation at Trollak in the south of Perak on the Malay peninsula. A little distance from the other workers, a young Chinese girl of sixteen was tapping a rubber-tree. She was carefully cutting the channel in the bark, down which the gum would run, when she felt a hand laid gently on her bare shoulder. She started and quickly turned her head. And what she saw made her freeze with terror. A woman stood behind her, if one could call such a hideous and hairy female a woman. She was more like a monkey. Her long black hair hung in a tangle all down her back, in striking contrast to her white skin. She had hair on her arms and on her chest, her eyebrows were large and bushy, and she even had a moustache. She wore nothing but a sort of loincloth of yellow bark, and had a strong animal smell. Her intentions were certainly peaceful. It even seemed as if she had been sent by two no less hairy males, who stood some distance off, as though trying not to frighten the girl. But the female gave a friendly grin, showing long fangs like a beast and gave a sort of croak like a bird. The Chinese girl screamed in terror and fled as fast as her limbs would carry her.

It was not a nightmare. The next day the girl saw the three creatures swimming in a river. A Tamil rubber-tapper, who had also seen the strange trio, confirmed every detail of the girl's account and added that the creatures were of fairly large size and that the males had moustaches which fell down to their waists. When the manager of the plantation heard of this encounter he immediately reported it to the police at

Kuala Lumpur, for his people were terrified and did not dare return to work. Two patrols of the Malay security force were sent to the place to hunt the intruders. Corporal Wahab of the Malayan Home Guard saw the three strange creatures on a river-bank, but did not fire on them because he thought that they might be men, such as the Sakai. They dived into the water before his eyes and vanished into the jungle on the far bank. During the next few days the three ape-men, as they were now called, were seen by a good half-dozen people. All their descriptions were the same, and agreed that the creatures were about 5 feet 10 inches high, well built and very hairy all over their bodies. They had been referred to as apes, but they seemed so human in some respects that the police gave the order to bring them back alive.

Local scientific circles began to be excited. Mr G. de G. Sieveking, director of Malayan museums, said that he hoped to organise an expedition to search the Trollak plantations in the hope of tracking down and capturing one of these strange creatures. He pointed out that they wore a strip of skin or bark round their waists and that they ran like men, never using their arms as the anthropoid apes do. In these respects they were human. But their receding foreheads, projecting brow and bushy eyebrows were those of more primitive creatures. These traits and their long canine teeth, which projected even when their mouths were shut showed, Mr Sieveking cautiously remarked, "that these creatures could be the survivors of one of the first wandering tribes which came to Malaya."

Which wandering tribe? Certainly not the Veddah-like Sakai, nor the pygmy Semang which are too small, dark and hairless. Was he really thinking about a Pithecanthropus? Certainly no human being has canine teeth which project beyond the level of the others. Even in the Pithecanthropus they project only very slightly. But possibly these large canines seemed so strange in a human face that the witnesses exaggerated them. In any case it may have been partly due to a self-inflicted mutilation. The Semang, among others, file their teeth to a point.

Mr Sieveking thought that these hairy men must have already had some contact with civilisation, for they recognised guns and were afraid of them. An inquiry revealed that several of the same creatures had been seen in the states of Kelantan and Perak in 1937. If they had happened to see hunters with guns they would soon realise the danger of firearms.

Such is the story. No trace of these three creatures has been seen since, and Mr Sieveking is now inclined to be sceptical about the original reports. I can only leave the reader to draw his own conclusions.

CHAPTER FIVE

Orang Pendek, the Ape-Man of Sumatra

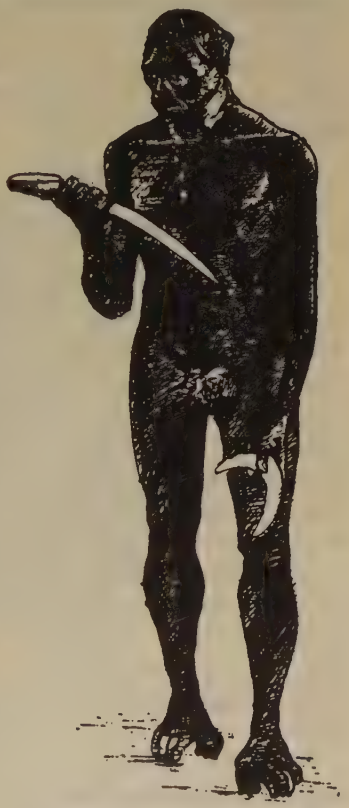
. . . or Pan himself,
The simple shepherd's awe-inspiring God.
WILLIAM WORDSWORTH, *The Excursion.*

THE natives of Sumatra believed in an ape-man long before remains of a Pithecanthropus were discovered in the neighbouring island of Java, and indeed long before Ernst Haeckel had even invented the idea of such creatures in 1865.

In *The Origin of Species*, Charles Darwin did not carry his theory of evolution to its conclusions about the descent of man lest he should shock religious opinion. His German colleague had no such qualms, and coolly put forward a complete family tree showing how man had risen step by step from the animal kingdom. As imaginative as he was learned, he even invented new creatures to fill the gaps in the genealogy. The nearest direct ancestor of man that he could suggest was the Dryopithecus, an anthropoid ape of the Miocene period, but it seemed too large a jump between this beast and Pleistocene man, so he invented a quite hypothetical creature half way between the two, which must have lived, he said, in the intervening Pliocene period. He called it *Pithecanthropus*, or "ape-man."

The existence of this imaginary beast was so well rooted in the minds of Darwinians and Haeckelians that on his sixtieth birthday they gave Haeckel a painting by Gabriel Max of a family of ape-men. It showed a male, accompanied by a female suckling her child; they were rather fearful creatures, being a mixture of men and apes in equal proportions. Like men, their skin was bare, their hair long and loose, and they walked upright. Like apes, they had a receding forehead, beetling brow, receding chin and slightly splayed big toes.

When this present was offered to Haeckel no one in the West knew that remains of an actual ape-man had been discovered in Java by one of his disciples. A young Dutch doctor called Eugène Dubois had joined the Medical Service of the Colonial Army in the hopes of being posted to the Dutch East Indies, for he thought that in Indonesia, the country of the gibbon, man's closest relation according to Haeckel, he had the best chance of finding the bones of an ape-man. And the fact remains that in Java, at Trinil on the bank of the River Solo, he dug out of the Pliocene volcanic tufa a fragment of a skull with heavy brows and a receding forehead. Its cranial capacity seemed to be between that of an anthropoid ape and a man. There were also two molars and a pre-molar, as well as a human-looking femur which indicated that the creature walked upright. On the basis of these remains Dr Dubois announced in 1894 that he had discovered the "Missing Link." The evolutionists were delighted, and at the 1900 Exhibition the public were able to admire a reconstruction of *Pithecanthropus erectus* made of painted *papier-mâché* in the Dutch East Indian pavilion.



30. Reconstruction of the Java ape-man in the Dutch East Indies pavilion at the 1900 Exhibition. (The fig-leaf was added in the photograph on which this drawing is based.)

Dr Dubois's conclusions were severely criticised—and not without reason—but in the end they were confirmed as a result of systematic excavation in Java from 1936 to 1939 organised by the Dutch palaeontologist Ralph von Koenigswald, which brought to light three more fragmentary skulls of ape-men. The discovery at Pekin of rather more complete remains of a similar ape-man (which has been named *Sinanthropus*, but should more logically have been *Pithecanthropus pekinensis*) has increased our knowledge of

these creatures. Were they really man's ancestors? It is hard to maintain this view. Most anthropologists see them as a branch which split from the human family tree at the end of the Tertiary era. But others think they were giant gibbons which had given up living in trees; and this was Dr Dubois's eventual opinion.

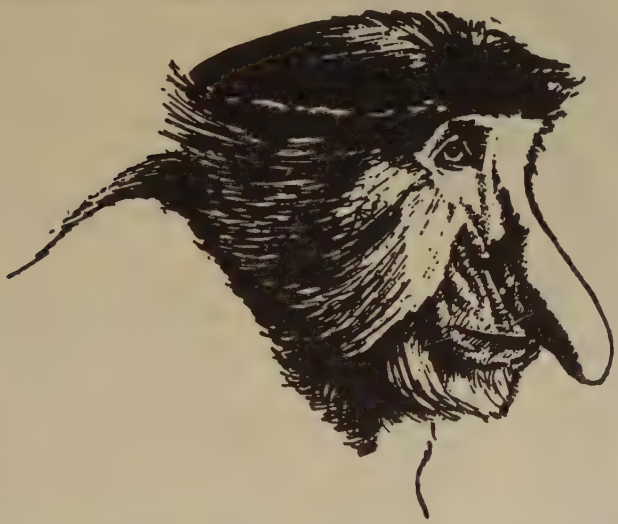
At all events they existed in Java. And across the Sunda Straits in southern Sumatra ape-like men have been believed to exist since time immemorial. Marco Polo was the first to bring this story to the West, writing of Lambri (probably the province of Jambi) he says:

> In this kingdom are found men with tails, a span in length, like those of the dog, but not covered with hair. The greater number of them are formed in this manner, but they dwell in the mountains, and do not inhabit towns.

William Marsden, who was Secretary at the Residence at Benkoelen in Sumatra and edited an English edition of Marco Polo in 1818, thought that this fable arose from the actual existence of two types of native in the Sumatra hinterland who lived in the woods and avoided all contact with the other inhabitants. They were known as *orang kubu* and *orang gugu*. The first were fairly numerous especially in the country between Palembang and Jambi. They had their own language and ate anything: deer, elephants, rhinoceroses, dogs, snakes and monkeys. The *gugu* were much rarer, and were covered with long hair. Marsden's *orang kubu* are very well known today (they are usually given the Dutch spelling *koeboe*) and are a tribe of natives who live in the mountainous forests in the south-east of the island, in fact exactly where Marsden put them. The *orang gugu* seem at first to be orang-utans, for, as Bontius remarked, "The Javanese maintain that these animals can speak but refuse to do so for fear of being made to work."

One thing is certain: neither of them has a tail. But we have already seen that a tail is merely a symbol of savagery. Besides, Marco Polo had certainly not seen these appendages himself, he was trusting to a legend which already existed. More recent stories, which are still current today, say nothing about men with tails in Sumatra: on the contrary, they tell of little wild creatures which walk upright like men and are hairy like apes, like the *nittaewo* of Ceylon. The Dutch settlers call them either *orang pendek* (sometimes spelt *pandek*), which means "little man," or *orang letjo*—"gibbering man." *Orang pendek* is the local name only in the north of Benkoelen and the south of Palembang. In other districts the name is *atoe pandak*, *atoe rimbo*, *sedapa*, *ijaoe*, *sedabo* or *goegoeh*. This last is plainly the same as Marsden's *gugu*.

The natives insist that the *orang pendek* is not any of the three species of gibbon to be found in Sumatra, nor is it an orang-utan, though people ignorant of the Malay language have often been misled into thinking the two names are connected because the first word is the same, and that the natives therefore believe in several species of orang-utan. Actually *orang* merely means "man"—or "man-like creature," whether it is used in such phrases as *orang pendek* (little man), *orang malayu* (Malay man) or *orang utan* (man-of-the-woods). (Incidentally *orang-utang*—a frequent mispelling—means "man in debt"!) The Malays



31. The proboscis monkey of Borneo, which the natives call *orang blanda* or "Dutchman."

also use the word *orang* for non-anthropoid apes. In Borneo the famous proboscis monkey (*Nasalis larvatus*), the male of which has a nose 2¾ inches long, is called *orang blanda*, which means "Dutchman." The illustration, and the fact that the Malays themselves have rather short noses, may explain the reason why.

The *orang pendek*, according to reports, is a very shy biped which speaks an unintelligible language. It is between 2 feet 6 inches and 5 feet high. Its skin is pinkish-brown and, according to most versions, covered all over with short dark brown to black hair. It has a head of jet-black hair forming a bushy mane down its back. It has no visible tail. Its arms are not as long as an anthropoid ape's. It hardly ever

climbs in trees, but walks on the ground. It is supposed to walk with its feet reversed, the heels facing forwards. Otherwise its habits are very ordinary. It eats young shoots, fruit, fresh-water molluscs, snakes and worms, which it finds by turning over stones and even, with herculean strength, the trunks of fallen trees. It is very partial to durian fruit. And sometimes it raids banana or sugar-cane planations, or the natives' gardens. This man-faced beast is known all over southern Sumatra below the equator. As Marsden's note shows, western travellers had heard of it at the beginning of the nineteenth century, but it was not for another hundred years that the Dutch settlers began seriously to believe that it existed.

32. Drawing of the *orang pendek* based on the traditional descripitions.

In 1917 it was mentioned in an article in a Dutch scientific journal by Dr Edward Jacobson, a settler interested in natural history. He told how two natives whom he employed to collect specimens had come upon a mysterious animal known locally as *orang pendek*. Dr Jacobson was camping in the forest at the foot of Boekit Kaba, near the Soban Ajam plantation, on 10 July 1916, when hunters came and told him that they had seen, at a distance of some 20 yards, an *orang pendek* looking for larvae in a rotten stump. The creature was black and agreed with the traditional description of the legendary beast. When it realised that it had been seen it made off, running along the ground on its hind-legs. Dr Jacobson realised that it could not be an orang-utan, which would have made its escape from branch to branch of the trees. Near Mount Kerintji, a little farther north, he was able to examine a footprint which

his guide said was an *orang pendek*'s, and it was not at all like an orang-utan's. It was like a little human foot, but broader and shorter. He concluded that there must be an unknown anthropoid ape in Sumatra. This would not have been surprising, for several new animals had just recently been discovered on that little-explored island, among them the Sumatran hare.

A year later, another settler, L. C. Westenek, produced some more evidence about this creature. Like everyone else, he had not at first believed in the legend of the *orang pendek*, but he had enjoyed hearing about it along with other such creatures as the *orang boenian*, or cave spirits, the river-babies and the *si bigau*, those gnomes whose toes point backwards and who keep wild pigs. One night, around the fire, he heard how there lived in the forests of the Barissan mountains between the coast at Painan and the crest of the hills some little men with whom it seemed you had to be on friendly terms. When you went off into the jungle, it was wise always to be provided with tobacco or, failing that, dried moss to use as a substitute, to offer these pygmies if you met them. If you did not leave a handful of tobacco in front of your camp they would torment you all night, making a continual shindy or coming and stealthily pulling branches off your hut. Westenek had been much amused by these delightful tales, but one day in 1910 the following events altered his opinion:

> A boy from Padang employed as an overseer by Mr van H—— had to stake the boundaries of a piece of land for which a long lease had been applied. One day he took several coolies into the virgin forest on the Barissan mountains near Loeboek Salasik. Suddenly he saw, some 15 yards away, a large creature, low on its feet, which ran like a man, and was about to cross his path: it was very hairy and it was not an orang-utan; but its face was not like an ordinary man's. It silently and gravely gave the men a disagreeable stare and ran calmly away. The coolies ran faster in the opposite direction. The overseer remained where he stood, quite dumbfounded, and when he returned to camp he set down in writing what he had seen. His little note is in my possession.

After citing Dr Jacobson's account, which I have already mentioned, Westenek goes on to report an adventure which happened to Mr Oostingh, manager of the coffee plantation at Dataran. At the end of 1917 he lost his way in the virgin forest during an expedition in the eastern foothills of Boekit Kaba between the rivers Aier Kembang and Aier Roeso. After going round and round in the thick forest for several hours until about two o'clock in the afternoon, he saw someone sitting on the ground about 10 yards away who looked as if he were

lighting a fire. Oostingh would have been very glad to meet anyone who could tell him how to get home to Dataran, but before he could ask the way he was struck by what he saw:

> I saw that he had short hair, cut short, I thought; and I suddenly realised that his neck was oddly leathery and extremely filthy. "That chap's got a very dirty and wrinkled neck!" I said to myself.
>
> His body was as large as a medium-sized native's and he had thick square shoulders, not sloping at all. The colour was not brown, but looked like black earth, a sort of dusty black, more grey than black.
>
> He clearly noticed my presence. He did not so much as turn his head, but stood up on his feet: he seemed to be quite as tall as I (about 5 feet 9 inches).
>
> Then I saw that it was not a man, and I started back, for I was not armed. The creature calmly took several paces, without the least haste, and then, with his ludicrously long arm, grasped a sapling, which threatened to break under its weight, and quietly sprang into a tree, swinging in great leaps alternately to right and to left.
>
> My chief impression was and still is: "What an enormously large beast!" It was not an orang-utan; I had seen one of these large apes a short time before at Artis [the Amsterdam Zoo].
>
> It was more like a monstrously large siamang, but a siamang has long hair, and there was no doubt that it had short hair. I did not see its face, for, indeed, it never once looked at me.

For lack of a better explanation, Westenek wondered whether Oostingh had not seen a siamang after all, a great black gibbon which had reached a venerable age.

> Might not the *orang pendek* be the same among the gibbons as the old solitary bulls are among elephants? Lone, ill-tempered great-grandfathers, hated by all the females in their tribe, who have lost most of their hair as a result of mange or age?

This seems to me one of the most reasonable theories that have been put forward about the strange creature of the Barissan mountains. Gorillas, when they grow old, soon become too heavy to go on living in trees. Might not the same be true of gibbons, except that in their ease it would have to be for some other reason, such as rheumatic old age?

Unless, of course, the *orang pendek* were a very special sort of gibbon: one that had decided to stick to its two feet, while its cousins still swung acrobatically in the trees; and one which as a result had grown enormously large, or, perhaps, because it had grown so large, no longer felt at home except on the ground. But such a gibbon would be more like a Pithecanthropus—and why not? Certainly it would be less odd than the conclusion drawn by Dr Dammerman, curator of the Museum at

Buitenzorg. He says that the various descriptions of the *orang pendek* make one think of an orang-utan, "especially Mr Oostingh's account, apart from the detail that the animal was black and had short hair." This reminds me of the old riddle: "Why is Moses like Napoleon?—They both have beards, except Napoleon"!

Westenek's article encouraged other settlers to give details of their own experiences. Dr Jacobson reported the evidence of Mr Coomans, manager of the State Railway at Padang.

> Once when I was prospecting for minerals in Benkoelen footprints of pygmies were found by one of my European foremen, a man on whose word I could rely, in the valley of the Oeloe Seblat, between the north Redjang and the coast, that is to say, in the Barissan mountains. They were like a child's footprints, but broader. Later the same informant found the same prints near Soungei Klomboek between Lais and Air Dingin. He noticed the circumstance that along this creature's path the stones had been turned over here and there, as though it was looking for food beneath them.

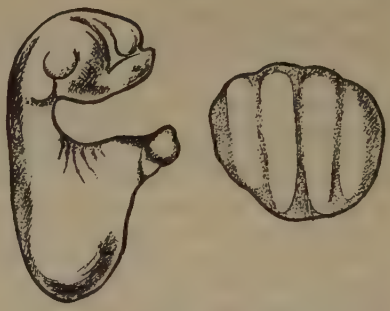
Dr Jacobson also spoke of his own experiences. In 1915 at Sioelak Deras several natives told him that they had once or twice seen an *orang pendek*. They all insisted that it was not a siamang; besides, it did not move through the trees but walked on the ground. They said that in the days when there were more rhinoceros in the Kerintji area they saw *orang pendek* more often. The rhinoceros were caught in pits which trapped them with their feet in the air, and one sometimes saw an *orang pendek* perched on the rhinoceros's belly, eating the flesh. Dr Jacobson therefore concluded that it could not be an anthropoid ape, for no known species is carnivorous, though some will eat birds and small mammals. But there is no reason why a carnivorous species of anthropoid ape should not exist.

From Sioelak Deras Dr Jacobson then went to the edge of the Danau Bento, a huge swamp south-east of Mount Kerintji surrounded by virgin forest stretching all the way to the River Jambi. On 21 August 1915, while out in this uninhabited country, where some hunters go to trap deer, his guide Mat Getoep drew his attention to some curious footprints on the bank of a stream (Fig. 33). They could not be confused with the very peculiar trail of the orang-utan (Fig. 34). The Sumatran maintained that these prints, which were not more than 5 inches long, had been made by an *orang pendek*.

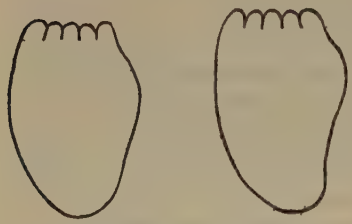
Captain R. Maier, an official surveyor at Benkoelen, made quite a collection of such footprints. His work frequently took him into the

interior and he gathered what information he could about the *orang pendek*. Mr Lambermon, manager of the coffee plantation at Kaba

33. Footprint attributed to the *orang pendek*, found on 21 August 1915 by Dr Jacobson near the Danau Bento swamp.



34. Imprints made by the foot (*left*) and second phalanges of the hand (*right*) of a walking orang-utan.



35. Footprints attributed to the *orang pendek* found on 21 September 1918, the left at Roepit and the right on Boekit Kaba, by Lambermon.

36. Footprints attributed to the *orang pendek* found by Mohamad Saleh; (*left*) in the S. Aro forest, 25 January 1920; (*right*) near Air Roepit, January 1921.

37. Footprints attributed to an *orang pendek* and its young, found near Air Masoedje by Raden Kasanredjo.

Wetan, gave him a drawing of two sets of footprints, both found on 21 September 1918, at Roepit and the sides of Boekit Kaba (Fig. 35). Later Mohamad Saleh, a native surveyor in Captain Maier's service,

brought him a sketch of a footprint found in the forest at Marga Ambatjung on 25 January 1920. A year later he found another very similar print near Air Roepit (Fig. 36). Another Sumatran surveyor, Raden Kasanredjo, sent Captain Maier a drawing of a double track found near Air Masoedje, made by one animal of the usual size and another much smaller, presumably its young (Fig. 37). There are very clear differences between these prints: while Lambermon's and Raden Kasanredjo's are much alike, Mohamad Saleh's squarer prints seem to belong to a different animal, or at all events to the feet at the other end of the same one, for the hind- and fore-feet of the same creature often produce very different prints. None of these prints seems to be identical with those drawn by Dr Jacobson.

By far the most exact description of the *orang pendek*'s appearance is that due to a Dutch settler called van Herwaarden. In 1916 he was prospecting for valuable timber in the state of Palembang, and heard tell of a mysterious creature called a *sedapa*. But the accounts were so fantastic and so contradictory that he could not believe that they referred to an unknown "man-of-the-woods." In 1917 he returned to the town of Palembang, where the Malay traders who often went into the *oeloe* told him something of the *orang pendek*. But he could not credit these stories that this creature had only one eye in the middle of its forehead, that it walked with its heels forward, climbed up trees like a gecko and could turn itself into a tiger. It came at night and stole wool off the sheep's backs to make itself a mattress to sleep on, but it helped lost rattan-pickers to find their way. This was too much for van Herwaarden, and he abandoned his inquiries about the creature.

But at the beginning of the following year he was exploring the Semangoes district of Moesi Oeloe when he was surprised to see prints of bare feet, very much like a man's, alongside a small river. There were two trails, one large and one small, which he thought must have been made by a mother and her young one. He made a careful sketch of the prints, but it was lost when he accidentally fell into a river. Some days later he met a Mr Breikers, who had also found similar footprints, and realised that perhaps all the fantastic rumours about the *sedapa* might after all be based on an animal by no means mythical. He therefore began collecting information about it again, especially among the forest-dwelling Koeboes. None had ever seen an *orang pendek*: its senses were so keen, they said, that no man could come near it. But eventually he met three Koeboes who had each seen a *sedapa*. Their descriptions agreed perfectly: they all said that it was a creature that walked upright

and stood between 4 feet 11 inches and 5 feet 3 inches high. It had a hairy body, long hair on its head and unusually long canine teeth.

Then several years passed without van Herwaarden hearing anything about the strange beast, until one day he learnt that in the forest near the village of Pangkalan Balai, in the Banjoeasin district, a local Malay had recently found the bodies of two dead *sedapas*, a mother and child. He had tried to bring his find back to the village, but the bodies were in such an advanced state of putrefaction that he had to give up this unpleasant task. He died soon afterwards; the villagers said it was because he had touched a *sedapa*. And there is no need to bring in magic to see that they may have been right; humping a stinking carcase about through tropical forest is not a healthy occupation, with the jungle scratching at one's limbs and leaving open wounds ready to be infected by one's septic load.

Van Herwaarden also learnt that near Sebalik, in the same district, a party of Malays in canoes had encircled a *sedapa* in the water, but the creature dived and escaped them.

In October 1923 [he writes] I was travelling in the same region and was on the island of Poeloe Rimau [1] most of which is leased to Mr G. Fischer. For several days from early morning to late afternoon I had been tracking a sounder of wild pig in the cleared part of the island. But, alas, it was to no purpose, although there were countless tracks.

Finally I decided to have one last try and lay in wait, crouching down and well-hidden. For an hour nothing happened. Then I happened by chance to look round to the left and spotted a slight movement in a small tree that stood alone. By now it was time for me to be going home, for it was not advisable to journey through such country after sundown. But all the same I was tempted out of curiosity to go and see what had caused the movement I had noticed. What sort of animal could be in that tree?

My first quick look revealed nothing. But after walking round the tree again, I discovered a dark and hairy creature on a branch, the front of its body pressed tightly against the tree. It looked as if it were trying to make itself inconspicuous and felt that it was about to be discovered.

It must be a *sedapa*. Hunters will understand the excitement that possessed me. At first I merely watched and examined the beast which still clung motionless to the tree. While I kept my gun ready to fire, I tried to attract the *sedapa*'s attention, by calling to it, but it would not budge. What was I to do? I could not get help to capture the beast. And as time was running short I was obliged to tackle it myself. I tried kicking the trunk of the tree, without the least result. I laid my gun on

[1] This island in the State of Palembang does not lie off the coast. It is part of the mainland surrounded by rivers.

the ground and tried to get nearer the animal. I had hardly climbed 3 or 4 feet into the tree when the body above me began to move. The creature lifted itself a little from the branch and leant over the side so that I could then see its hair, its forehead and a pair of eyes which stared at me. Its movements had at first been slow and cautious, but as soon as the *sedapa* saw me the whole situation changed. It became nervous and trembled all over its body. In order to see it better I slid down on to the ground again.

The *sedapa* was also hairy on the front of its body; the colour there was a little lighter than on the back. The very dark hair on its head fell to just below the shoulder-blades or even almost to the waist. It was fairly thick and very shaggy. The lower part of its face seemed to end in more of a point than a man's; this brown face was almost hairless, whilst its forehead seemed to be high rather than low. Its eyebrows were the same colour as its hair and were very bushy. The eyes were frankly moving; they were of the darkest colour, very lively, and like human eyes. The nose was broad with fairly large nostrils, but in no way clumsy; it reminded me a little of a Kaffir's. Its lips were quite ordinary, but the width of its mouth was strikingly wide when open. Its canines showed clearly from time to time as its mouth twitched nervously. They seemed fairly large to me, at all events they were more developed than a man's. The incisors were regular. The colour of the teeth was yellowish white. Its chin was somewhat receding. For a moment, during a quick movement, I was able to see its right ear which was exactly like a little human ear. Its hands were slightly hairy on the back. Had it been standing, its arms would have reached to a little above its knees; they were therefore long, but its legs seemed to me rather short. I did not see its feet, but I did see some toes which were shaped in a very normal manner. This specimen was of the female sex and about 5 feet high.

There was nothing repulsive or ugly about its face, nor was it at all ape-like, although the quick nervous movements of its eyes and mouth were very like those of a monkey in distress. I began to talk in a calm and friendly way to the *sedapa*, as if I were soothing a frightened dog or horse; but it did not make much difference. When I raised my gun to the little female I heard a plaintive "hu-hu," which was at once answered by similar echoes in the forest nearby.

I laid down my gun and climbed into the tree again. I had almost reached the foot of the bough when the *sedapa* ran very fast out along the branch, which bent heavily, hung on to the end and then dropped a good 10 feet to the ground. I slid hastily back to the ground, but before I could reach my gun again, the beast was almost 30 yards away. It went on running and gave a sort of whistle. Many people may think me childish if I say that when I saw its flying hair in the sights I did not pull the trigger. I suddenly felt that I was going to commit murder. I lifted my gun to my shoulder again, but once more my courage failed me. As far as I could see, its feet were broad and short, but that the *sedapa* runs with its heels foremost is quite untrue.

For a year van Herwaarden kept silent about this moving encounter, for he wanted to catch one of these creatures first rather than expose himself without evidence to general disbelief. When he had to return to Europe he decided to speak, so that others could benefit from his experience.

Some most surprising opinions have been expressed about van Herwaarden's encounter. Thus although Professor Hill, the expert on the *nittaewo*, seems to be convinced that a genuine ape-man exists in Malaya, he thinks that it must have been a gibbon which van Herwaarden took for an *orang pendek* at Poeloe Rimau. But quite apart from its size, a gibbon with hair hanging half way down its back is no ordinary gibbon. Besides a gibbon makes off through the trees, never by running on the ground. The opinion of Dr Dammerman, curator of the Museum at Buitenzorg, is even more staggering. He remarks that no white man except for van Herwaarden has ever seen the creature (what about Oostingh?) and adds:

> But this writer is almost too exact in his description of the animal, so that it does not seem impossible that the incident was either based on his imagination, or, that he has written it strongly impressed by the stories about the *orang pendek*.

I leave the reader to judge for himself the credibility of van Herwaarden's account. Personally I find it refreshingly sober. Dr Dammerman betrays his determination to be sceptical at all costs when he concludes:

> But even while admitting the general truth of the story, would it not be more likely that the animal in question was an orang-utan?

More likely? A black orang-utan with long flowing hair, a face not at all ape-like, distinct and even bushy eyebrows, with arms that do not reach to its knees, and moreover running on its hind-legs? It is hard to criticise such an opinion and remain civil.

In fact the most striking thing about van Herwaarden's story is the very *human* character of the creature, so that one is rather surprised to find that he keeps calling it a "beast." Its only two features which are not human are its relatively long canine teeth and extremely long arms (a man's arms reach half-way down his thighs, in chimpanzees and gorillas they reach the knee, and in gibbons and orang-utans to the middle of the shin). Otherwise the description of the creature could apply to a man. The long hair reminds one of the Veddahs and their allied races, but they have bare skin, whereas the *sedapa* was very hairy. The problem remains unsolved.

In August 1924 Dr A. Steinman brought from Sumatra to Buitenzorg in Java a photograph of an apparently human footprint, supposed to be that of an *orang pendek*. This time there was an incontrovertible piece of evidence, and not an unreliable tracing; and thanks to the kindness of the Resident at Palembang, Buitenzorg Museum was able to possess the actual footprint; it had been found in the Aer Teman estate, near Moeara Bliti in Upper Palembang. Molten paraffin wax was poured into the footprint to hold the dry surface earth together, and, when it had set, the thin solidified crust was lifted out of the earth into which the wax had not penetrated.

P. van Kan, administrator of the Aer Teman estate, related the circumstances in which the footprint was discovered in a letter to the Resident at Palembang.

> Last March I was surprised to find my coolies were going about armed in the palm-oil section at Taba-Pingin. Several people, among them the *mandoer* [overseer], were carrying spears when they went to work. When I asked them why they were doing so, the *mandoer* told me that a strange animal had been through the area several times.
>
> I then examined the various tracks in person and thus discovered a curious footprint, which I had never seen before. I am sending you a cast.

The natives maintained that the footprints must have been made by an *orang pendek*, which they greatly feared. One of the men even said that he had seen these animals by moonlight with his own eyes. There were two of them walking on their hind-feet. They were between 4 feet 6 inches and 5 feet 6 inches high, and were entirely covered with hair except on their faces, which were much less hairy. They had broad chests and short legs. Their canine teeth were large and striking. They ran away, giving a sort of whistling noise.

After examining the footprints with care Dr Dammerman of Buitenzorg Museum had little difficulty in showing they they belonged to a Malayan sun-bear (*Ursus* (*Helarctos*) *malayanus*), the little coconut bear, called *bruan* in Sumatra. Besides, they were found in two very different forms, those of the fore- and the hind-feet, which conclusively proved that the creature was a quadruped. But the mistake was very easily explained, for the perfectly plantigrade hind-feet of a bear—"the beast that walks like a man," as Kipling called it—leave prints very like those of human feet. The claws do not always leave a mark, for they are sometimes retracted when the creature is walking.

I have examined the lead casts of these prints sent to the Brussels

Royal Institute of Natural History by O. J. Rookmaker, chief administrator of the Rokan district, and I cannot but agree with Dr Dammerman's conclusion:

> The peculiar belief that this mysterious ape-man walks with his heels turned to the front may find its origin in the bear tracks. The Malay bear often turns his feet in, that is to say with his toes turned in and the heel turned out.

Moreover a bear's feet are the "wrong way round" in one sense. The striking feature of its footprints is that the most conspicuous toe, slightly separated from the others, which seems to correspond to our big toe, is really the little toe, that is to say the outside one. Thus it is true in one sense that the trail of a bear's hind-feet looks as if it had been made by a man with his feet "the wrong way round." This may well have given rise to the legend that the *orang pendek* walks with its feet "back to front."[1]

38. Footprint attributed to the *orang pendek* (*left*) which was found on the Aer Teman estate. It is obviously identical with that of the hind-foot of a Malayan sun-bear (*centre*) whose front footprint is shown on the right.

Dr Dammerman also adds:

> Most likely some other details told about the *orang pendek* may be brought home to the bear, as for instance the turning over of tree-trunks and stones, and the partiality to the fruit of the durian tree.

These arguments are much less convincing, for bears are not the only creatures to look for larvae or insects in logs of wood, and the succulent durian fruit is also the orang-utan's favourite food.

One thing is certain: the Malayan sun-bear is, of all the bears, the one which most often stands on its hind-feet; the position is habitual. But it never *walks* upright. Can one say that it is responsible for *all* the footprints attributed to the *orang pendek*? Yes, if one maintains that the triangular prints drawn by Dr Jacobson, Lambermon and Raden Kasanredjo were made by its fore-feet, and the more rectangular prints sketched by Mohamad Saleh by its hind-feet. But, while the latter is undoubtedly true, the former is more questionable. The reader can compare for himself the drawing of the print of a bear's fore-foot and

[1] An alternative explanation will be found on page 135.

the various triangular footprints. On the other hand I should point out that when a bear is walking it almost always puts its hind-feet on the prints left by its fore-feet, and so generally leaves a blurred composite trail.

To sum up, it is clear that some of the reports of the *orang pendek* have been inspired by the footprints of the Malayan bear, and even by this flat-footed creature itself, which stands about 5 feet high on its hind-legs. Its very short blackish hair, lighter face and projecting canine teeth might account for some details reported of the mysterious ape-man. An engineer called Nash whose work occasionally took him to the Rokan district was disappointed one day when his guide told him to stop because he had spotted an *orang pendek*; he lifted his gun, aimed, fired and killed a bear. In his book, *La Chasse à Java*, H. de Wals tells of a similar misadventure. What he had taken for an *orang pendek* was an old bear whose neck and back were entirely bald.

But it is doubtful whether the legend of the *orang pendek* can be based solely on an animal which most Sumatrans know well by the name of *bruan*. There are many superstitions about the legendary beast, so it is not surprising that the natives give it the credit for any strange tracks in soft earth or barely distinguishable shape glimpsed through the thick jungle vegetation.

39. Malayan sun-bear on its hind-legs, an attitude it often adopts.

In 1927 there were new rumours about the *orang pendek* in southern Sumatra. One day a tiger trap was found sprung, but the animal which had sprung it escaped without being seen. To judge by the tracks left in the vicinity it must have been an *orang pendek*.

> But on the trap [writes Dr Dammerman] some hair and traces of blood were found; only the discovery was not made at once, but a few days after the animal had escaped. The blood and the hair were examined; it was impossible to obtain any positive results with regard to the hair, but the blood pointed faintly to human origin. However we may not accept for a fact that the blood found came from the escaped animal: it is quite possible that it came from some native who had injured himself while handling the trap.

Dr Dammerman's comments puzzle me. Why was it "impossible to obtain any positive results with regard to the hair"? The analysis of hair is an advanced science which gives very precise indications about the nature of the animal. It should at least have been possible to say what animal could *not* have left the hair. To know, for instance, that it was neither a bear nor an ape would be infinitely precious. Note also the subtlety of the phrase "the blood pointed faintly to human origin." The analysis of the blood must have shown that it was either of human or of animal origin. But that it could "faintly point" to a human origin passes understanding. Does it mean that the creature from which the blood came was *almost* a man? Or that Dr Dammerman could not bring himself to admit the human characteristics of the *orang pendek* in question? This is what his suggestion of "some native" lends one to believe.

It is clear that the analysts have not been able to identify either the hairs or the blood with those of any known creature.

On 22 May 1932 it looked as if the mystery would at last be solved. The West Sumatran newspaper, the *Deli Courant*, announced that it had received a despatch from O. J. Rookmaker in Pasir-Pengojaran in the south of the island saying that the Rajah of Rokan had surprised two *orang pendek*, one of them a baby. He had fired at them and had brought back the body of the smaller one.

Actually the news was incorrect, for the Rajah had not done the deed himself, though in 1912 he and a friend had seen four *orang pendek* looking for bamboo shoots 15 yards away. They agreed with the usual description and were the size of a child of 12 or 13. The Dutch settlers had not heard of this incident until 1931, when similar accounts were reported by people prospecting for rattan and rubber. They had

begged the Rajah to do all he could to capture the beast. A large reward was offered to anyone who succeeded; and in May 1932 four natives of Rokan had decided to organise an expedition to bring back one of these jabbering men, dead or alive. According to their story they had suddenly come upon an *orang letjo* in the River Rokan Kiri. It was some 60 yards away, collecting small shellfish on a half-submerged tree-trunk, and looked more human than ape-like. They had fired at it all the same and wounded it in the arm, whereupon it had dropped a pale object, a baby *letjo* which had been mortally wounded by the same bullet that had hit its mother.

A few days after its first despatch, the *Deli Courant* published a more detailed report: the new-born *letjo* was 16½ inches high and seemed very human in its anatomy. Its skin was bare, the hair on its head was an even grey. It was sent to the Zoological Museum at Buitenzorg to be examined. On 9 June more details were published in the *Deli Courant* together with a photograph. The creature's arms were rather short; and it could not therefore be an anthropoid ape. On the other hand it could not be new-born, for its teeth were well-developed. It seemed as if a surviving specimen of a "Missing Link" had at last been discovered.

But a few days later the results of Dr Dammerman's examination of the young "ape-man" were published. The whole thing was a colossal hoax. The supposed baby was merely an ordinary lotong (*Trachypithecus*), a sort of langur, which had been shaved all over except on the top of its head. To complete its appearance, its nose had even been stretched with a piece of wood, its cheek-bones had been crushed and its canine teeth filed to a point.

There was nothing new about such hoaxes in Sumatra. Marco Polo had exposed them seven centuries before, when pedlars selling curiosities from the Far East to Western travellers asked a high price for the mummified bodies of "little men" which they said came from the Indies.

> It should be known that what is reported respecting the dried bodies of diminutive human creatures or pigmies, brought from India, is an idle tale, such pretended men being manufactured in this island in the following manner. The country produces a species of monkey, of a tolerable size, and having a countenance resembling that of a man. Those persons who make it their business to catch them, shave off the hair, leaving it only about the chin and those other parts where it naturally grows on the human body. They then dry and preserve them with camphor and other drugs, and having prepared them in such a mode that they have exactly the appearance of little men, they put them

into wooden boxes, and sell them to trading people, who carry them to all parts of the world. But this is merely an imposition, the practice being such as we have described; and neither in India, nor in any other country, however wild (and little known) have pigmies been found of a form so diminutive as these exhibit.

Annoyed at being taken in by the same trick that had been played on innocent travellers in the Middle Ages, the world of science has ever since remained obstinately silent about the *orang pendek*, and shelved it with the unicorn and the phoenix.

But is this logical? The fact that a forger of genius painted "Vermeers" which took in experts of the highest repute does not mean that the great Dutch painter never existed or that he did not paint his own pictures.

It is quite possible that the problem of the *orang pendek* may even have already been solved. Last March several newspapers published the following despatch which clearly seems to refer to the mysterious beast in question, though it has been given another name:

FIRST CAPTURE OF A "SINDAI" (ANTHROPOID APE) IN SUMATRA

Jakarta: The Indonesian authorities announce the capture of a *sindai* in the jungle in South Sumatra. The *sindai* is an anthropoid ape which is known to exist (the Dutch once offered a reward of 5,000 florins to anybody who could produce one) but no specimen has ever been captured.

The animal caught is a female, about 4 feet high, very hairy and with very long nails. It will be taken to Palembang.

Unfortunately a revolution broke out in Sumatra soon after this news was announced, and so far I have been unable to discover anything more about this sensational capture. It may of course be yet another hoax, perhaps even a code message to the rebels to rise! Who knows?

CHAPTER SIX

The Not So Abominable Snowman

> There was exactly the very Print of a Foot, Toes, Heel and every Part of a Foot; how it came thither, I knew not, nor could in the least imagine . . . nor is it possible to describe how many various Shapes affrighted imagination represented things to me in . . .
>
> DANIEL DEFOE, *Robinson Crusoe.*

AFTER his sixth attempt on Everest, Eric Shipton was exploring the neighbouring Gauri Sankar range with Michael Ward and the Sherpa Sen Tensing. At four o'clock in the afternoon of 8 November 1951 they found a very clear trail of enormous human-looking feet in the powdery snow on the south-western slopes of Menlung-tse. They followed this strange trail for about a mile until they lost it in a moraine of ice. Being unable to follow the mysterious creature any farther, they took photographs of its footprints.

Roughly oval in shape, they seemed to have been made by human feet—but feet more than a foot long. Shipton remarks that they were "slightly longer and a good deal broader than those made by our large mountain boots." A man on this scale would stand about 8 feet high. The big toe was clearly visible, slightly separated from the rest, but there seemed to be only three other toes. Of course it was possible that two toes might be held so close together that they left only a single print in the snow. "Where the tracks crossed a crevasse," Shipton goes on, "one could see quite clearly where the creature had jumped and used its toes to secure purchase on the snow on the other side."

Ever since 1899, when explorers still had to disguise themselves as pilgrims or itinerant merchants in order to enter Tibet, strange rumours had been reaching the West about the giants that lived in the icy heights of the Himalaya. In that year appeared Major L. A. Waddell's *Among*

the Himalayas, in which he tells how in 1889 he found large footprints in the snow leading up towards the high peaks in the north-east of Sikkim.

> These were alleged to be the trail of the hairy wild men who are believed to live amongst the eternal snows, along with the mythical white lions, whose roar is reputed to be heard during storms. The belief in these creatures is universal among Tibetans.

During the first attempt to climb the North Face of Everest in 1921 the rumours became more detailed. On the way from Kharta to the pass at Lhapka-la, Colonel Howard-Bury and his companions saw dark spots moving over the snow in the far distance—there were living creatures in these almost inaccessible heights well above the snow line. Then, on 22 September 1921, when they reached the place, about 23,000 feet up, where they had seen them, they found enormous footprints—more than three times as big, they said, as normal human footprints. The leader of the expedition attributed them to a large stray grey wolf, but the Tibetan porters thought otherwise. To them there was no doubt that these were footprints of the *metoh kangmi* or "abominable snowman." They trembled with fear as they gave an alarming account of the creature.

From the native reports, which agree in the main, one can compile the following description of the monster. The snowman is a huge creature, half man, half beast; it lives in caves high and inaccessible in the mountains. The skin of its face is white; the body is covered with a thick coat of dark hair. Its arms, like those of the anthropoid apes, reach down to its knees, but its face looks rather more human. Its thick legs are bowed; its toes turn inwards—some even say they turn backwards. It is very muscular and can uproot trees and lift up boulders of remarkable size. The female can be recognised by her long breasts which she throws over her shoulders when she runs.

These monsters are said usually to feed on yaks' meat and snow-worms. Sometimes, when driven by hunger, they come down into the valleys, carry off people and devour them gluttonously. They are so savage that in time of famine the females will occasionally eat their mates. Naturally there are few details of their habits, for those who see them from close rarely live to tell the tale. But you can escape from the abominable snowman by rushing down a snowy slope as hard as you can go; if it tries to follow you, its hair falls into its eyes and it cannot see. Some say that abominable snowmen are the wandering spirits of women who have died a violent death and that they are not dangerous if they are not provoked.

40. Reconstruction of the abominable snowman based on the most detailed evidence available.

These legends are found for thousands of miles all over the Himalayan range, from the Karakoram to northern Burma, in Tibet, Nepal, Sikkim, Bhutan and Assam, and the creatures have many different names in different countries.

Henry Newman, a very reputable columnist in the Calcutta *Statesman*, seems to have been the first to publish the Tibetan name *metoh*

kangmi ("abominable or filthy man of the snow"), which he misspelt *metch kangmi*; Frank Lane says that the Indian peasants on the high plateaux call the abominable snowmen *bhanjakris* (but Mr M. P. Koirala, Prime Minister of Nepal, has pointed out that the name *banjhankris*, or "forest wizards," refers to almost unknown forest tribes "credited with great powers of healing"); the Sherpas call the snowmen *yeh-teh* (hence *yeti*) or *mi-teh*, words whose very controversial meaning will be discussed later; Ernst Schaefer asserts that the same creatures are called *migu* around the Green Lake at the foot of the Kangchenjunga range, and Frank Smythe quotes the faintly similar names of *mirka* and *ui-go*, all of which are probably misheard variants of the *mi-go* known to linguists; in Sikkim we find the name *sogpa* or *shukpa*, but this is also applied to the Tibetans of the eastern plains and valleys, and even to all the Mongols; finally it seems that in the mountains of Burma the snowman is known as *tok* or "mouth-man."

As one might expect, most naturalists dismissed the legend of the abominable snowman with its ludicrous details. But uneducated Tibetans or Nepalese were not the only people to spread this story. Some decades ago an Englishman called Hugh Knight on his way to Tibet reported that he met a creature whose description agreed with the legendary monster. In order to let his mount get its breath he halted in a sort of amphitheatre surrounded on all sides by mountains capped in snow. Suddenly he heard a sound of stones rolling down a slope and turned his head. Some 30 yards away a sort of large blond gorilla was standing up on its bow legs. When it realised that it had been seen it made off, running sometimes on its hind-legs and sometimes on all-fours. But the most astonishing part of Knight's description is that with one muscular arm the creature was holding a *bow and arrow*!

Be that as it may, Knight is not the only educated man to tell of such an astonishing encounter. In 1925 a Fellow of the Royal Geographical Society called N. A. Tombazi reported a no less startling story in his *Account of a Photographic Expedition to the Southern Glaciers of Kangchenjunga in the Sikkim Himalaya*. About 9 miles from the Zemu glacier, at an altitude of some 15,000 feet, he noticed his porters waving and pointing at an object lower down.

> The intense glare and brightness of the snow prevented me from seeing anything for the first few seconds; but I soon spotted the "object" referred to, about two to three hundred yards away down the valley to the East of our camp. Unquestionably, the figure in outline was exactly like a human being, walking upright and stopping occasion-

ally to uproot or pull at some dwarf rhododendron bushes. It showed up dark against the snow and, as far as I could make out, wore no clothes. Within the next minute or so it had moved into some thick scrub and was lost to view.

Such a fleeting glimpse, unfortunately, did not allow me to set the telephoto-camera, or even to fix the object carefully with the binoculars; but a couple of hours later, during the descent, I purposely made a detour so as to pass the place where the "man" or "beast" had been seen. I examined the footprints which were clearly visible on the surface of the snow. They were similar in shape to those of a man, but only six to seven inches long by four inches wide at the broadest part of the foot. The marks of five distinct toes and of the instep were perfectly clear, but the trace of the heel was indistinct, and the little that could be seen of it appeared to narrow down to a point. I counted fifteen such footprints at regular intervals ranging from one-and-a-half to two feet. The prints were undoubtedly of a biped, the order of the spoor having no characteristics whatever of any imaginable quadruped. Dense rhododendron scrub prevented any further investigations as to the direction of the footprints, and threatening weather compelled me to resume the march. From inquiries I made a few days later at Yoksun, on my return journey, I gathered that no man had gone in the direction of Jongri since the beginning of the year.

When the news reached Darjeeling, the press, as usual, headed their comments with captions of "Wild Man," "Snow-Man," and the like, seen near Kangchenjunga by an "Italian" traveller . . .

When I asked the opinion of the Sirdar and the coolies they naturally trotted out fantastic legends of "Kangchenjunga-demons." Without in the least believing in these delicious fairy-tales myself, notwithstanding the plausible yarns told by the natives, and the references I have come across in many books, I am still at a loss to express any definite opinion on the subject. However, I can only reiterate with a sufficient degree of certainty that the silhouette of the mysterious being was unmistakeably identical with the outline of a human figure. I personally rejoice in particularly acute vision and am sufficiently familiar with the appearances of mountain fauna to be able to distinguish a bear, monkey, snow-leopard, ostrich, kiwi (if you like) [1]—and even a man. I am also somewhat versed in the simple analysis of spoor, and can unhesitatingly state that the prints were those of no wild animal common to the Sikkim Himalaya.

Tombazi goes on to suggest his own theory, somewhat tentatively, since it does not agree with the shape of the footprints, which were too broad in proportion to their length to be a man's:

I conjecture then that this "wild man" may be either a solitary or else a member of an isolated community of pious Buddhist ascetics, who

[1] The *Manchester Guardian* had suggested that what he had seen was a running bird of some kind.

have renounced the world and sought their God in the utter desolation of some high place, as yet undesecrated by the world. However, perhaps, I had better leave these conclusions to ethnological and other experts.

The explanation often put forward that the snowman is a *sadhu*, one of those Hindu hermits who do in fact live at altitudes up to 15,000 feet in the Himalaya, is superficially attractive, but it agrees neither with the beast's alleged appearance nor with the size and shape of the tracks it leaves in the snow.

Unquestionably the strangest account we have of the abominable snowman is that given by Jean Marquès-Rivière in *L'Inde Secrète et sa Magie*. It comes from an Indian pilgrim, that is to say a well-educated person who could be expected to know several languages and often be as well-informed in Western learning as in the philosophy of his own country. His description therefore deserves to be quoted in full, strange though it is:

> Yes, there is a race of giant men, who are neither monkeys nor bears, and who live in certain forests in Nepal. I have met witnesses who have seen them from afar and have heard them talking in an unknown language; I have seen them myself once. . . .
>
> When I was going to certain Tibetan monasteries on the northern frontier of Nepal, some Nepalese friends told me one day that footprints of the snowman had been seen and that a small armed expedition was going off in that direction. I joined them; for eight days we walked through jungle ten feet high. . . . At last, one day, we heard in the stillness of noon, a continual rumbling sound: the place was wild and desolate. The snow sparkled above us, and crumbling rocks, huge trees and imposing waterfalls formed a splendid landscape. At first we thought it was a far-off avalanche; but to an attentive ear the continual rumbling had a certain rhythm. We thought that a tribe of aborigines was somewhere near and decided to go and question them . . .
>
> Suddenly, as we were approaching the place from which we supposed the noise came, one of us noticed some footprints in the moist and clayey ground we were walking on; in front of us the tracks of enormous naked feet about two feet long disappeared in irregular lines. A gust of terror shook the little party. "Snowmen!" they cried, and fled, forgetting that they had come to look for them. In the end we found that there were three of us willing to go on; we told ourselves that after all these creatures could not be more savage than tigers and wild elephants; we had survived those, so we should be able to survive these.
>
> We went forward cautiously; the noise grew louder. Suddenly one of us made a sign to stop and look. In front of us, in a natural circle of high rocks, among the huge hunks of broken stone, an extraordinary spectacle met our eyes: some ten giant ape-men, ten to twelve feet high,

were gathered in a ring. One of them was beating a primitive tom-tom made of a hollow tree-trunk. The man's strength must have been terrific to judge by the noise he was making. The others swayed silently in time with the tom-tom. It was some religious ceremony, no doubt, for their solemn manner and attitude showed that they were performing a magic rite. Their bodies were covered with hair and their faces were half-way between a gorilla's and a man's. But there was nothing of the animal about their attitude, and the one that was beating the tom-tom stood quite upright like a human being. They were quite naked, in spite of the bitter cold in this desolate region, and a strange sadness could be seen on their frightful faces.

We looked for a long time at these representatives of an unknown race that fled from man. Where did they come from? What were they? There was no tribe of men in this neighbourhood, and they were only known in these areas by the huge footprints that they left in the snow and the muddy clay. How did they live? What did they eat? The men and women that they sometimes carried off had never come back to tell us.

It is more than likely that this story is a little embroidered and poeticised in the oriental tradition of narrative, but this does not mean that it is a complete invention.

Inevitably most of the descriptions of the snowman come from very simple people: peasants and porters, who are terrified of it. The guides who accompany travellers threaten to turn back when fresh prints of bare feet are found. Frank Smythe tells how during the 1930 Kangchenjunga expedition the noise made by a yak bursting in unexpectedly set his porters in a real panic; they thought they were being attacked by snowmen. When he learnt the actual cause of the commotion, one of the Sherpas called Nemu told Smythe that he had several times seen "*bad manshi*," as he called them in pidgin-English, with his own eyes. He said that they were huge white men covered with thick fur. A Miss MacDonald of Kalimpong also told Smythe how, when she was passing through a defile at a great height on a journey to Tibet, she heard a terrifying roar, unlike any animal's cry that she had ever heard. Her porters were panic-stricken; they dropped their loads and left her there alone. According to the numerous witnesses who have described the snowman's cry—some even trying to imitate it—it is a "loud yelping," often compared to the sad sound of "the mewing of a sea-gull," but of course much louder.

Western explorers had no way of verifying the snowman's existence except by studying the strange tracks of bare feet in the high snows.

During the summer of 1931 Wing-Commander E. B. Beauman, a pilot in the R.A.F., saw them on a glacier some 14,000 feet up near the source of the Ganges. In 1936 Eric Shipton also saw them 16,000 feet up on his return from Everest. "They resembled a young elephant's tracks except that the length of the stride suggested a biped." When they saw these tracks, the porters refused to go any farther on the excellent pretext that several of their friends had been victims of this Himalayan ogre and that they did not want to suffer the same fate.

A little later the well-known ethnographer and botanist Ronald Kaulback also met them looking "exactly as though they had been made by bare-footed men" some 16,000 feet up in the south-east of Tibet, on the main route between the valleys of the Ge-chu and the Upper Salween. As there were no bears in the region as far as he knew, he thought they must have been made by a snow-leopard (*Panthera* (*Uncia*) *uncia*). The porters, of course, at once spoke of "Mountain Men." And one of them who had happened to see one from fairly close described it it as like a man with white skin, naked, with long hair on its head, shoulders and arms. Kaulback thought that the lack of food at this altitude was enough to refute the legend, but this objection applied equally well to the snow leopard.

In 1937, 20,000 feet up in the Bhundhar Valley, Frank Smythe found footprints in the snow, and followed the trail up to the entrance of a cave. He gives a strange description of the prints.

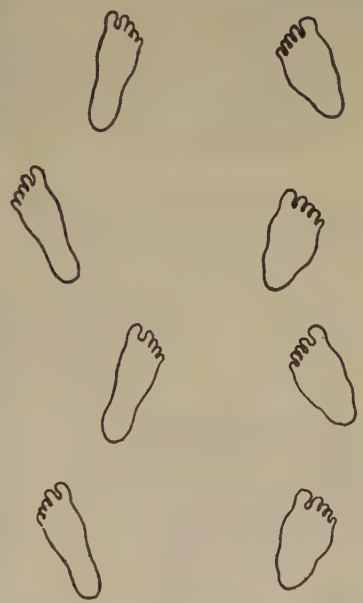
> On the level the footmarks averaged 12 to 13 in. in length and 6 in. in breadth, but uphill they averaged only 8 in. in length. The stride was some 1½ to 2 ft. on the level, but considerably less uphill, and the footmarks were turned outward at about the same angle as a man's.[1] There were well-defined imprints of five toes, 1½ inches to 1¾ inches long and ¼ of an inch broad, unlike human toes, arranged symmetrically. Lastly, there was what appeared to be the impression of a heel with two curious toelike impressions on either side.

Footprints of this kind gave rise to the belief sometimes held by the Sherpas that the *yeti* has extra toes and walks with its feet back to front. This is yet another version of the legend current in Sumatra about the *orang pendek*; it was believed since time immemorial, for even in Megasthenes's *Indica* of the fourth century B.C. we read, "In the mountains called Nulo there are men whose feet point backwards and have eight toes on the ends."

Smythe's photographs of the trail showed that it was indisputably a

[1] They were not, as I shall explain, but they looked as if they were.

bear's. The marks of the extra toes were really those of the side toes of the hind-feet, for when a bear is walking it usually puts its hind-feet down in the footprints of its fore-feet. Moreover it turns its feet inwards, so that from the position of the prints alone the trail looks as if it is going in the opposite direction.[1] Then the toes are seen to be on the wrong end of the foot, and so the legend of the men with their feet back to front arose. Since these men lived in the same places as the snowmen, and had similar habits, the character was sometimes transferred from one to the other.



41. Comparison between a human trail (*left*) and a bear's (*right*). Actually a bear's prints are never so clear, since the prints of the hind-feet are rarely exactly superimposed on those of the fore-feet. At a superficial glance the bear's trail may look as if it is walking *down* the page, with its toes turned *outwards*.

To many zoologists it seemed that the affair of the abominable snowman could now be shelved. But this view was premature: true snowman's footprints, as we shall see, never show the same characteristics as a bear's trail. All the same, the idea that its feet were turned backwards seemed to be firmly rooted in local tradition. A curious letter written in 1915 by J. R. O. Gent, a forestry officer in the Darjeeling Division, to H. J. Elwes, the celebrated botanist and Himalayan explorer, who read it to the Zoological Society of London on 27 April of that year, should be included in the snowman's dossier.

> I have discovered the existence of another animal but cannot make out what it is, a big monkey or ape perhaps—if there were any apes in India. It is a beast of very high elevations and only goes down to Phalut in the cold weather. It is covered with longish hair, face also hairy, the ordinary yellowish-brown colour of the Bengal monkey. Stands about 4 feet high and goes about on the ground chiefly, though I think it can also climb.
>
> The peculiar feature is that its tracks are about eighteen inches or two feet long and toes point in the opposite direction to that in which the

[1] A bear's feet are also "back to front" in another sense (see page 122).

animal is moving. The breadth of the track is about 6 inches. I take it he walks on his knees and shins instead of on the sole of his foot. He is known as the jungli-admi or sogpa. One was worrying a lot of coolies working in the forest below Phalut in December, they were very frightened and would not go into work. I set off as soon as I could to try and bag the beast, but before I arrived the Forester had been letting off a gun and frightened it away, so I saw nothing. An old choukidar of Phalut told me he had frequently seen them in the snow there, and confirmed the description of the tracks.

It is a thing that practically no Englishman has ever heard of, but all the natives of the higher villages know about it. All I can say is that it is *not the Nepal Langur*, but I've impressed upon people up there that I want information the next time one is about.

Gent's explanation is certainly very ingenious, but no known monkey moves in this unusual way; and if it did it would not leave separate footprints, but two continuous furrows.

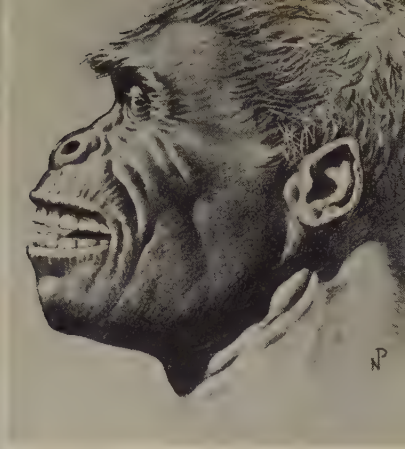
As a biped 4 feet high could hardly leave such enormous footprints, it seems that they could not have been made by the monkey which Gent describes, and which is probably the Himalayan langur, unless they were made by its four feet together. I shall return to this point later.

After Smythe's mistake, many other Himalayan explorers found strange footprints in the snow at unusually high altitudes. Among them was a correspondent of *The Times* who signed himself "Balu." In 1937 he was surveying in the Karakoram, in the north of the Himalayan range, when he was brought up short by a perfect row of large footprints, more or less round and about a foot in diameter. They were about 9 inches deep in the snow and 18 inches apart. "Nor was there any sign of overlap," he remarks, "as would be the case with a four-footed beast." The Sherpas, who identified them as footprints of the snowman, unhesitatingly recognised a bear's trail which they found in a valley several days later. They could not have mistaken the two.

In the same year, John Hunt discovered footprints in the Zemu Gap. Then in 1938, H. W. Tilman found them in the same place during a new attempt on Everest.

It was on one of the glaciers of the Menlung basin, at a height of about 19,000 feet, that, late one afternoon, we came across those curious footprints in the snow the report of which has caused a certain amount of public interest in this country. We did not follow them further than was convenient, a mile or so, for we were carrying heavy loads at the time, and besides we had reached a particularly interesting stage in the exploration of the basin. I have in the past found many sets of these curious footprints and have tried to follow them, but have always lost

Is the abominable snow-man a giant orang-utan? The orang-utan looks puzzled, but observe the shape of his feet.

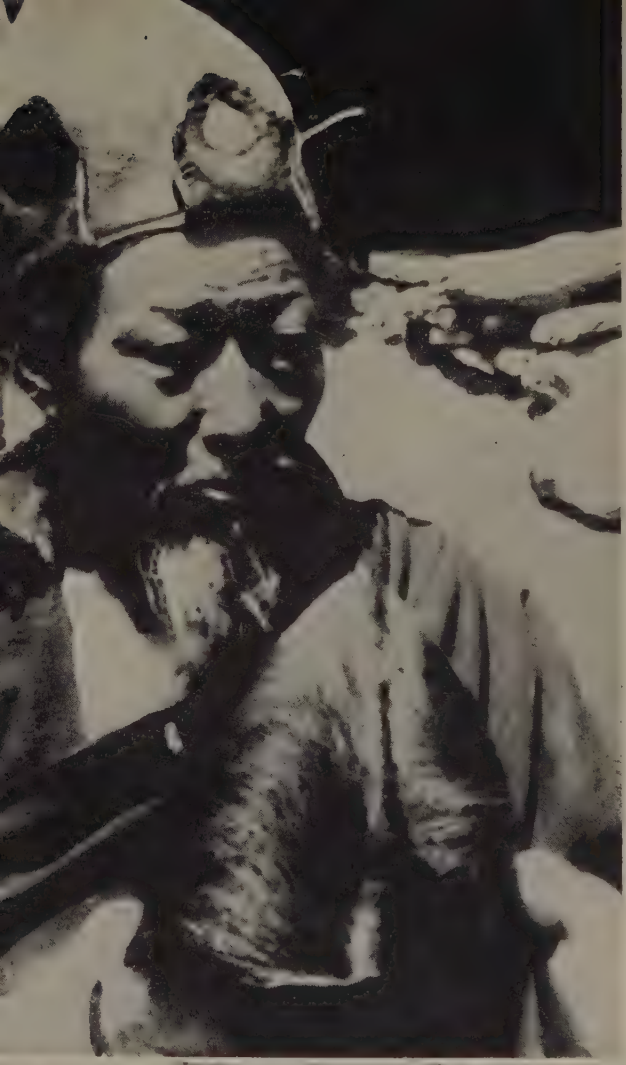


Reconstruction of the Swartkrans ape-man drawn by Neave Parker on evidence by anthropological experts.

The gibbon (*right*) is the only ape that is a biped by nature.

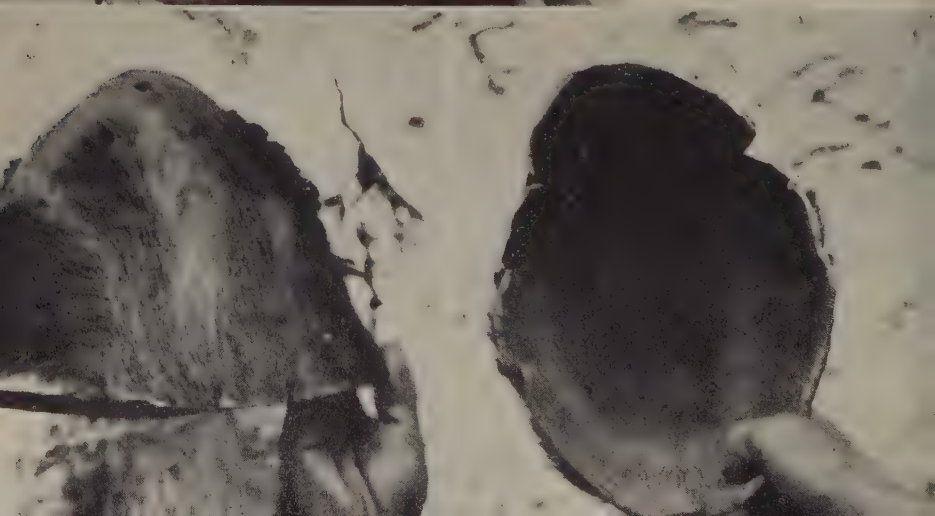
The abominable snowman's trail, photographed by Eric Shipton in 1951 with (*inset*) a single footprint compared to an ice-axe. Note how the footprints alternate regularly to left and right.

The brown bear's trail photographed on the Col de la Gentiane, Basses-Pyrenées by Dr Marcel Couturier. Note how the footprints are often superimposed and blurred, and the claw-marks visible.



The head-lama of Khumjung holding a snowman's scalp.

(*Below*) The Pangboche scalp, views of the side and the inside



them on the moraine or rocks at the side of the glacier. These particular ones seemed to be very fresh, probably not more than 24 hours old. When Murray and Bourdillon followed us a few days later the tracks had been almost obliterated by melting. Sen Tensing, who had no doubt whatever that the creatures (for there had been at least two) that had made the tracks were "Yetis" or wild men, told me that two years before, he and a number of other Sherpas had seen one of them at a distance of about 25 yards at Thyangbochi. He described it as half man and half beast, standing about five feet six inches, with a tall pointed head, its body covered with reddish brown hair, but with a hairless face. When we reached Katmandu at the end of November, I had him cross-examined in Nepali (I conversed with him in Hindustani). He left no doubt as to his sincerity. Whatever it was that he had seen, he was convinced that it was neither a bear nor a monkey, with both of which animals he was, of course, very familiar.

At a reception given at the British Embassy in Katmandu, Sen Tensing confirmed every detail of his description of the animal he saw near the monastery at Thyangboche, adding that "it moved mostly in an upright stance but when in a hurry dropped on all fours."

The snowman became news: Prince Peter of Greece, who was engaged in anthropological research in India and Tibet, wrote a long letter to the Indian newspaper, the *Statesman*, for he too had recently picked up some fairly detailed information about the mysterious creature.

For some time one of these snowmen—which were actually large monkeys—had been in the habit of coming in the night and drinking from a cistern at the mouth of the Jalap valley in Sikkim. Alarmed at the mere idea of sharing their drinking-water with such an unwelcome visitor, the villagers prepared for it a bucket full of fermented liquor. The brute came, drank as usual, and eventually collapsed, dead-drunk. The men found it in the morning and lashed it firmly to a pole. When it sobered up it recovered not only its senses, but also all its strength; it burst its bonds and escaped.[1]

When Dr Wyss-Dunant's Swiss expedition made its assault on Everest in 1952 it also found footprints exactly like those that Shipton had photographed the year before. On 18 April, René Dittert, André Roch and the famous Sherpa Tenzing Norkey set off on a reconnaissance along a glacier. There was a pea-soup fog. When the three men came

[1] Professor René von Nebesky-Wojkowitz of Vienna University tells another version of this story in *Wo Berge Götter Sind* (published in English under the inverse title of *Where the Gods are Mountains*). It was told him by one Nyima who was agent for the Tibetan minister Kabshopa and was said to have happened at the Natu Pass, an adjacent pass to Jalap-la. Otherwise the story is identical and may be taken as confirmation of Prince Peter's version.

back they found that at an altitude of 19,000 feet their own trails crossed those of a group of *yetis*, which had perhaps been shadowing them in the fog.

On the clearest footprints one could see a separate big toe and four other toes. In a statement to the Press Dr Wyss-Dunant declared that they had been made not by a biped but by a quadruped, probably related to a bear and weighing between 12 and 15½ stone.

In 1953, when the successful Everest expedition was at Thyangboche, Sir John Hunt took the opportunity of making inquiries about the *yeti* among the lamas at the monastery which lies some 15 miles south-west of the mountain at a height of 14,000 feet. He learnt from the second senior abbot that the monks occasionally saw snowmen on the heights above their settlement, and did not think there was anything mysterious about them. The last time they had seen one, in November 1949, it came out of a large clump of rhododendrons and played for some time in the snow no more than 200 yards away. "It was," Sir John reports, "a largish animal, five feet or more in height, covered with greyish-brown hair. It went mainly upright and occasionally dropped on all fours: it was also seen to scratch itself monkey fashion." The monks made a shindy with trumpets and cymbals, which soon drove the intruder back to its lair.

Actually this lama's report merely confirms the main details of Sen Tensing's; for he was present on this occasion with several other Sherpas.

The *yetis* were not welcome among the mountain people. Several miles away, on the northern slopes of the mountains, in Tibet, a party of snowmen made themselves thoroughly unpleasant by stealing crops, smashing outbuildings, fouling linen left out to dry and tearing the roofs off houses. Like the people in Prince Peter of Greece's story, the villagers put out bowls of *chang* (a sort of beer) near their dwellings. When they found the beasts sleeping off their liquor they slaughtered them without mercy. This massacre may seem a little improbable in a country where Buddhism teaches men to respect all forms of life. But the story also relates that after this outbreak the authorities took strict measures to prevent anyone in future from maltreating these simple if savage brutes.

At the end of 1953 Chemed Rigdzin Dorje Lopu, another Tibetan lama, drew a much more attractive picture of the abominable snowman than that of the legend. According to him it was a large and harmless monkey, not in the least "abominable," and it never went for human

beings unless it was attacked or threatened. This monk's teacher, the lama Tsultung Zangbu, one of the most learned men in Tibet, found himself face to face with a *yeti* one day when he was going to pray in the Chari hills in Assam. The snowman, which was carrying two large chunks of rock under its arms, went on its way without molesting the holy man.

Like all animals, the *yeti* is sacred, and its remains are worshipped as relics in lamaseries. This was how Chemed Rigdzin maintains he was able to examine the mummified bodies of two of these creatures, one in the monastery at Riwoche in the province of Kham, the other in the monastery at Sakya on the road from Katmandu to Shigatse. They were enormous monkeys about 8 feet high. They had thick flat skulls and their bodies were covered with dark brown hair about 1 inch to 1½ inches long. Their tails were extremely short.

What exactly did the lama mean by "thick flat skulls"? It would be impossible to tell if there were not other corroborative accounts of the shape of the *yeti*'s head. Sen Tensing said it had "a tall pointed head," and the famous Sirdar Tenzing Norkey confirmed this description when he told Sir John Hunt how his own father had once met a *yeti* "at the yak-herds' village of Macherma" at the mouth of the Dudh Kosi.

The elder Tenzing was driving his herd to pasture in the valley when a sudden disturbance among his animals drew his attention to a sort of little hairy man who was rushing down the mountainside in leaps and bounds. Tenzing was terrified and led his yaks to a stone hut in which they were usually penned, but the *yeti* was furious and leapt on the roof and started tearing off the shingles, which were merely held down with stones. The shepherd was forced to light a fire of dwarf juniper boughs and dried chollies, which gave off acrid smoke and eventually drove away the *yeti*, but not until it had let off its fury in a typically monkey fashion by dashing chattering round the hut, tearing up small shrubs and hunks of rock.

According to the elder Tenzing, the animal walked upright like a man, was about 5 feet high and its body was covered with reddish-brown fur. It had a large ape's features, "but the mouth was especially wide, showing prominent teeth." Its skull was high and conical in shape, and covered with hair so long that it fell down in front of its eyes.

It therefore seems as if Chemed Rigdzin meant by "thick, flat skulls" that the sides were particularly flat, making them pointed and conical in shape.

42. Roxellana's snub-nosed langur.

This was how the snowman's dossier stood at the end of 1953. On the whole it was treated with utter disbelief. When I tried to talk seriously about the creature to a fellow-scientist he gave me an old-fashioned look and asked whether I believed in Father Christmas. But the footprints in the snow could not be imaginary. How did science explain them?

Colonel Howard-Bury, as we have seen, attributed them to a grey wolf and Ronald Kaulback, though with some reservations, to a snow-leopard. Neither hypothesis in fact accords with the shape of the footprints. But in 1937, other and better supported explanations were put forward in *The Times*, the best arena in the world for passionate and learned controversy.

Guy Dollman of the British Museum (Natural History) believed in most of the natives' descriptions and pointed out that in the Himalaya

there were two species of monkeys of reasonable size. One was the Himalayan langur (*Semnopithecus schistaceus*) a stout quadrumane closely related to the hanuman, the sacred monkey of India (*Semnopithecus entellus*): it had been recorded in Tibet up to an altitude of 13,000 feet. It had a tougher constitution and longer and fleecier fur than the common species. The other was Roxellana's snub-nosed langur (*Rhino-*

43. Himalayan langur.

pithecus roxellanae) which the Chinese called the snow-monkey. It was a primate of much heavier build than the langur, with thick fur and a comically snub nose which made its face look very human. These monkeys were very rare and then still unknown in captivity; there were only a few stuffed specimens in museums. Thus it would be rather surprising to come upon a wild one.

The size of these creatures does not of course agree with the traditional description of the snowman, for the largest hardly ever exceed 4 feet 6 inches in height when standing on their hind legs. Moreover, the langur's area of distribution does not reach the places where the snowman's footprints are usually found: the snub-nosed monkey is found in country to the north-east of the Himalayan range, eastern Tibet and western China, whereas it is on the south-western slopes that we seem to hear most about the snowman.

All the same, most zoologists favoured the monkey theory when Eric Shipton brought back his famous photographs. They were supported by no less an authority than Dr T. C. S. Morrison-Scott, of the Mammals Section of the British Museum (Natural History), and went so far as to specify the race of langurs the pseudo-monster belonged to. It was a *Presbytis* [alias *Semnopithecus*] *entellus achilles*, they said, a langur which may stand as much as 5 feet high: the type specimen of this sub-species came from a place 12,000 feet up and some 50 miles north-west of Katmandu in Nepal. It was a graceful quadrumane, mainly fawn in colour with a black face and silvery head and neck. Its description, these zoologists maintained, agreed fairly well with that given by Sen Tensing, Shipton's guide.

Against this theory it was shrewdly objected that the footprints of a langur with long toes were not in the least like those in Shipton's photographs made by a large solid foot with short toes, and in any case an animal with feet no more than 9 inches long could not leave footprints 13 inches long. This latter objection was ingeniously evaded by an argument which a newspaper put thus:

> The colossal dimensions of the footprints are no doubt to be explained by the fact that they are made in the night in fresh snow and in the day-time they melt in the snow and increase in size. When night comes the footprints freeze again, retaining their shape so well that it is easy to attribute them to a race of giants.

Unfortunately, a few lines above, the same newspaper rashly observed that "the footprints are so far apart that it is impossible that they could have been made by a human being." A little thought should have made

it obvious that if a small animal's footprints were enlarged by the snow melting the length of its stride would appear to decrease, the prints might even merge.

Oliver Jones, Curator of Mammals at the London Zoo, put forward a very ingenious theory in an attempt to explain how a small langur could have left giant footprints. His view was that the footprints Shipton photographed had been made by *all four feet at once.* As it bounded across the snow the langur first put down its two hands side by side and then its hind feet, also held close together, immediately behind them. This would produce a string of large bilobate footprints.

This explanation seemed to be confirmed by W. W. Wood, a South African who had spent some time in Kashmir. In 1944, when on a trip in the mountains at Liddarwat near Srinagar with Major Kirkland and Captain John B. Maggs, he saw a monkey which he took for an abominable snowman. He wrote to *Country Life*:

> We were somewhere near the timber line—about 13,000 feet—when we saw a large animal bounding towards us down the snow-covered khud on the opposite side of the river. Its gait appeared to me to be that of a monkey in a hurry, with all four paws off the ground together. Maggs' recollection is that its rear legs were longer than the forelegs and its running not very different from that of a rabbit . . .
>
> The animal came up the mountain side, crossed our path and then sat down, monkey fashion, among the boulders to look at us. It obviously found us as strange as we did it. . . . It was tawny in colour, with a fringe round its face, was about the size of a man and had a long tail with a tuft on the end, like a lion. Maggs thought that its tail was more bushy than that of a lion and its coat of longish hair—reddish brown in colour—rather like that of a bear. The Kashmiris said that it was *bandar* (monkey).
>
> This strange creature was certainly neither bear nor langur. Can it, wandering alone at these altitudes, have been abominable snowman?

To which the editor replied:

> Despite our correspondent's assertion to the contrary, the creature was almost certainly a langur, for he gives a good description of *Semnopithecus entellus ajax,* a species of langur that lives at high altitudes among the head waters of the Indus drainage basin and is often found above the snow line. Admittedly this langur measures only about 30 inches head and body, but size is notoriously hard to judge in the mountains.[1]

[1] This is very true, and one may as well underestimate the size as exaggerate it. Thus the *yeti* could easily be larger than the 5 feet 10 inches to 6 feet 6 inches which some witnesses have reported. The huge size of its footprints would seem to show that it is.

All the same Wood's description of the monkey's strange progress in leaps and bounds corroborates Oliver Jones's theory. The snag is that some of Shipton's prints are too clear to have been made by four feet merged into one. You can distinctly see the general outline of the foot and the details of most of the toes. Moreover if you look clearly at the photograph of the trail you can see that the footprints alternate to left and right. This is proof that the animal is *walking*, for why the devil should an animal jump alternately to left and to right with absolute regularity? And a monkey like a langur would have left marks in the snow with its tail.

The footprints so often found in the snow were not made by a monkey, at least not by a tailed monkey standing hardly 4 feet 6 inches high. But this does not mean that no one has ever mistaken a tall Himalayan langur or a snub-nosed monkey for the legendary snowman. This is what Wood probably did and what Sen Tensing was thought to have done; but he did not; for it is unlike a man who knew the mountains so well not to recognise a monkey with which he must have been familiar. Nor was he the only person to think that the animal in question was a *yeti*; several other Sherpas and monks from the Thyangboche monastery were there and confirmed his opinion.

The party who maintained the *yeti* was a bear were in a stronger position, especially after Frank Smythe's mistake. According to their champion, Reginald I. Pocock, the creature responsible for the giant footprints could only be the red bear (*Ursus arctos isabellinus*), a local Tibetan species of the European brown bear. This bear, which rarely exceeds 6 feet 6 inches in height, could easily leave footprints 13 inches long, and what is more they would be astonishingly like a man's. Like the rest of the plantigrades, it sometimes stands on its hind-legs. If it were surprised in that position might it not give rise to the legends of hairy giants? And if some natives were attacked and eaten by an old male that had turned carnivorous (being often enough starving in country so poor in food) it would substantiate the rumours of ogres with a taste for human flesh.

This argument was firmly supported, among others by G. S. Cansdale, Superintendent of the London Zoo, and there were many good arguments in its favour. What, one might reasonably ask, could an entirely vegetarian monkey—a specialised leaf-eater like the langur—find to eat at an altitude of 19,000 to 23,000 feet? For these monkeys have never been reported above 13,000 feet—that is, above the tree line

—and this height is very exceptional. Major R. W. C. Hingston of the Indian Medical Service, who took part in the tragic attempt on Everest in 1924 and has collected much information about Himalayan fauna and flora, tells us that the plant *Parnassius* is sometimes found at 18,000 feet, but higher up all vegetable life seems to have disappeared. Nevertheless the 1952 Swiss expedition found traces of vegetation up to 21,000 feet. Vegetarian animals never go above this limit, except on rare occasions when driven to take refuge there. Certain rodents do so, for instance the pika or Everest mouse-hare (*Ochotona wollastoni*), a large tailless "rat," actually related to the hares, which is common up to 17,400 feet, but may stray as high as 20,000 feet. In the rocky country between the tree line and the perpetual snow there are also: wild boar; musk-deer; wild yaks; goat-antelopes like the serow and goral (*Naemorhedus*); the takin (*Budorcas*), a strange "ox-goat" related to them; the chiru (*Pantholops*), a gazelle-goat; such true goats as the Kemas tahr (*Hemitragus*) and the markhor (*Capra falconeri*); and the bharal or blue sheep (*Pseudois*). Certain species of agamid lizards of the genera *Phrynocephalus* and *Leiolepis* are often found on Everest above 16,000 feet. The *Daily Mail* expedition confirmed this in 1954. "In fact," the leader wrote, "we have found that wild life abounds as high as we have been able to climb—that is, certainly to 20,000 ft." Above 20,000 feet there seem to be only birds, but of many kinds. Climbers say that there are choughs above 26,000 feet and near the highest summits. While carnivores, such as snow-leopards, leopard-cats, wolves and Tibetan foxes, manage to live at 13,000 to 20,000 feet or even higher by coming down every day (or almost every day) to hunt for food at a lower altitude, vegetarians could not possibly live at such a height, for they cannot survive on large but irregular meals: they have to feed or chew the cud for most of the day.

For bears the problem of food does not arise the whole year round. During the bad season they leave off feeding and become lethargic and sluggish. Thus there is no theoretical reason why some species of bear should not spend the cold months of the year at high altitudes where it would be absolutely safe from attack.[1] And it is at the beginning and at the end of the hibernation season that footprints are usually found at unusual heights. The snowman generally leaves its tracks in autumn snows.

So far the bear theory seems very satisfactory. Indeed I favoured it

[1] In Europe, it is true, the contrary happens: bears leave the heights in autumn and come down into the valleys to hibernate.

at first myself after carefully comparing Shipton's photographs with various bears' footprints. Some so-called experts maintained that if the snowman were a bear, one would have seen signs of its claws. This is not so at all. The plantigrades stand mainly on the fleshy part of the sole of the foot and on the toes, and their claws do not always touch the ground. If it is indeed a bear one can even specify which of the bear's feet made the print in Shipton's clearest photograph. First of all it is plainly a *hind-foot*, for the fore-feet leave a much rounder print (see Fig. 38, p. 122). Secondly, if it was really made by a bear it was by the *right* hind-foot—though the layman would think, from the position of the big toe, that it was the left. But as I have already remarked what looks like a bear's big toe is actually its little toe. Everyone involved in the controversy seems to have overlooked this fact. And, knowing it, an expert would only have to glance at the trail to see whether the "big toe" was on the outside or the inside to know whether it was that of a bear or of some kind of primate.

It is a pity, therefore, that Shipton did not take a close-up of several successive footprints instead of just publishing a close-up of a single print and some general views of the trail as a whole, taken at an angle which completely distorts the shape of the footprints. All the same, when I examined them carefully they told me that it was wrong to think the creature was a bear on the sole evidence of a single footprint, however clear. For though the details of the footprints are lost in the photographs of the trail, their position is very clear; an almost straight track with each print a little off-centre, alternately to left and to right. The first explanation that springs to mind of such a trail is that it was made by a biped. Thus:

left foot left foot
right foot right foot

But is it impossible for a quadruped to make a trail like this? Certainly such a close and regular trail could not be caused by a *gallop*, not that a large animal would be likely to gallop across fairly steep snow-slopes. So there is no need to worry about the very peculiar way in which a quadruped puts its feet down when moving fast. The trail that a quadruped makes when walking or trotting can be considered as if it were made by two bipeds, one behind the other, moving at the same speed. It makes no difference whether it ambles or walks in the usual way, the feet may be put down at different times, but not in different places.

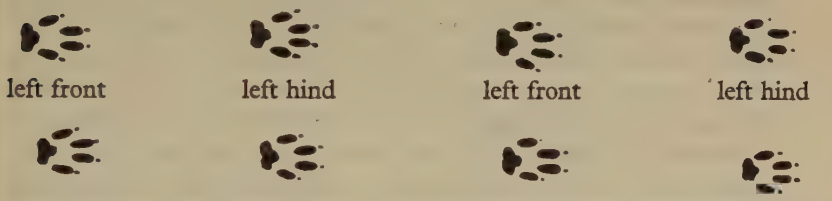
The snowman's trail could not have been made by a quadruped with front-feet a different distance apart than its hind-feet or they would be

44. Mouse's trail.

out of line. A mouse's trail shows this effect very well: there are four lines of footprints. But the snowman's trail is in only two lines.

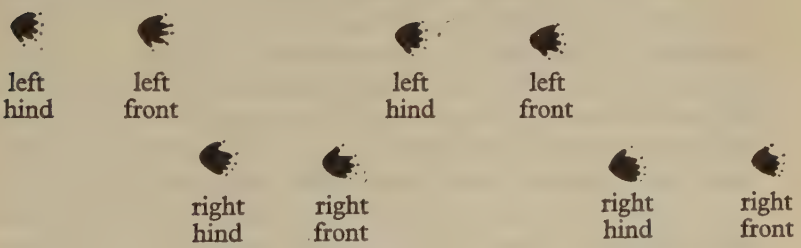
This leaves three possible kinds of quadruped's trail:

(1) The animal might put its hind-feet down exactly in between the footprints of its front-feet, thus:



45. Hypothetical trail.

(2) Most animals put their hind-feet down nearer to their front-feet, thus:



46. Otter's trail.

(3) Finally the animal might put its hind-feet directly on top of the prints of its front-feet, thus:

(left hind and front) (left hind and front) (left hind and front)
(right hind and front) (right hind and front)

Only the third of these kinds is arranged like the snowman's trail.

Every single mark is made by two footprints superimposed, and therefore the track is made up entirely of blurred prints. Now Shipton's footprints do not look at all like two superimposed prints (for surely they would never fit into one another perfectly). They are clearly outlined in the snow and their shape is very regular. They are not, as some have maintained, half obliterated and blurred by the wind. Shipton has stressed that they were fresh. Therefore unless the footprint so carefully photographed was an exceptional one—for instance when the animal was leaping across a crevasse—the track could only have been made by a biped. "Balu" too insisted that in the track discovered in 1937 there was no "sign of overlap, as would be the case with a four-footed beast." So if the animal was a bear, it was a bear that walked on its hind-legs. It is indeed true that bears occasionally adopt an upright gait when they are inquisitive or threatening; but I do not think they would ever do so for several hundred yards or that they could even manage it if they tried—especially on such sloping ground. Shipton followed the *yeti*'s track for about a mile.

It seems much wiser and more honest to adopt Sir John Graham Kerr's opinion. The Emeritus Professor of Zoology at Glasgow University replied to these hasty theories by acknowledging his ignorance; and admitting that, as far as he could judge, the footprints belonged to no animal known to zoologists.

If the species is unknown, one may still ask which zoological group of animals the *yeti* is most likely to belong to. The only plantigrade bipeds are man and those tree-dwellers the gibbon and the indris—all primates. Could the *yeti* be a large anthropoid ape as yet unknown?

There are two points against this hypothesis. Firstly, that all the anthropoids have an opposable big toe—like a thumb—clearly separated from the other toes, indeed almost at right angles to them when the foot is put on the ground. But in the snowman's footprint the big toe is almost as close to the other toes as a man's. Secondly, the anthropoids are usually quadrupeds. This is particularly noticeable in the gorilla, which soon grows too heavy to live in trees. The orang-utan seems to stand more upright, but this is just because its arms are so long that even when they are on the ground it can stand erect. It uses them like crutches. The gibbon uses its long arms in an original way, like a tight-rope-walker's balancing rod, when walking on its hind-legs. They would both walk like quadrupeds with their bodies horizontal if their arms were not too long. Unlike man, the anthropoid apes are not built to walk on

47. Outline of the left footprint of (*from left to right*) gorilla, snowman, man, and bear.

their hind-legs. Their skull does not sit upright with the centre of its base on the top of the spinal column, nor is the spine curved inwards at the small of the back and the nape of the neck. They always tend to fall over forwards, and only crutches or balancing rods can prevent them from doing so. Their arms fulfil this purpose.

Nevertheless it is not impossible for anthropoid apes to walk on their hind-legs, even if they find it hard going. With patience it is possible to train a chimpanzee to walk some distance on its hind-legs. Certain climates may even naturally encourage such a gait, or so it would seem from the evidence of Dr Sydney W. Britton, Professor of Anthropology at the University of Virginia. Snow had fallen, and he was curious to see how a chimpanzee that had arrived from Africa during the previous year would react to a phenomenon so utterly new to it. He did not expect it to walk erect in the snow, but to his surprise it stood up after the first few steps and went on walking in the same position. The American anthropologist thought that this showed that snow had played a vital part in man's evolution into a biped. Be that as it may, his evidence undoubtedly throws light on the problem of the snowman: it shows that in the Himalayan snows an ape could easily have learnt to walk on its hind-legs in an attempt to reduce to a minimum its painful contact with the ice beneath the snow. The "human" formation of this ape's big toe could also be explained in the same way. The French zoologist Albert Gaudry pointed out in the last century that man has retained the plantigrade feet of a primitive mammal and that they cannot have evolved from the apes' prehensile feet, specialised to suit their life in trees. It is the other way round: apes' feet seem to have evolved from feet like man's. If a quadrumane's feet were really primitive they would be identical with hands because they would have undergone the same

evolution from fish's oval fins. Actually an ape's foot is still a true foot with a well-developed heel, lengthened and curved toes, and a big toe which has gradually separated from the rest and become opposable. In

48. Orang-utan walking in an upright, but still quadruped, position.

1936 and 1937 Dr Serge Frechkop of the Belgian Royal Institute of Natural History published original arguments, independent of Gaudry's, arriving at the same conclusion.

A primate that, like man, had not become specialised to living in

trees would, like him, have retained truly plantigrade feet. It is easy to see how if a line of apes evolved in increasing size they would very soon have to give up living in trees. But a habitat in thick forest is hardly suitable for a giant species (this, according to Urbain and Dekeyser, shows that the gorilla is nearing the end of its evolution or more probably has already reached it). A giant ape would have a better chance of surviving in open country, and being relatively ill-armed for the struggle for existence and too exposed to its enemies in the plains, the mountains would be its ideal habitat, and there the snow would encourage it to become a biped. Thus, in theory at least, a race of giant apes, with primitive plantigrade feet and a tendency to stand on their hind-legs, could have arisen in the mountain snows.[1]

So, in the end, had we not better humbly accept the evidence of those who describe the snowman as a giant ape, a sort of hairy ogre? Most people may reply that giants have never existed, but have merely arisen in popular imagination, and that science has never found the least trace of their existence. This view might have been defensible a dozen years ago, but not today.

In 1934 Ralph von Koenigswald, a young Dutch geologist and palaeontologist, who later contributed so much to our knowledge of the Pithecanthropus (the famous Java ape-man), was wandering about the streets of Hong Kong looking for curiosities. He went into an old-fashioned Chinese chemist's shop. It was not so much a dispensary as a junk-shop where magical drugs were compounded of such diverse ingredients as rhinoceros-horn and the intestines of flying lizards, and he vaguely hoped to pick up something odd or even interesting. He had come to China to study its fauna, and among this junk one sometimes came upon stuffed specimens of rare animals, dried insects, shells or even pieces of fossils sold as *lung tchih* (dragon's teeth) or *lung koo* (dragon's bones). On the counter he noticed a jar full of teeth of all sorts and picked up a handful. It was child's play for him to recognise what animal they belonged to, for teeth, especially those of mammals, are like identity cards to an expert. Suddenly he stopped with a shiver, so astounded, as he later recalled, that his hair actually stood on end. He held in his hand a tooth that looked to be human—he could tell that it was a third lower molar—but a tooth far larger than any man or ape had

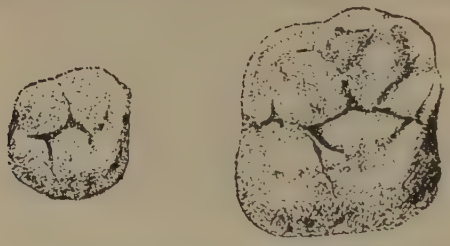
[1] This argument can be checked by applying it to a hypothetical carnivore instead of a hypothetical primate, and reaching the conclusion that a race of giant carnivores, with primitive plantigrade feet and a tendency to stand on their hind-legs, could have arisen in the mountain snows. They have. They are bears.

ever possessed. Its volume was five or six times greater than the corresponding tooth of a man. It was a giant's molar.

"Where did you get that?" he asked the chemist in a faint voice.

The Chinese did not know. It had been in that batch of teeth for a very long time. No doubt his father or his grandfather or even some more distant ancestor had got it from some peasant. They often found "dragon's teeth" in the fields.

Von Koenigswald set about scouring every shop in the district. Two years later, across the water in Canton, he found another tooth similar to the first, this time an upper molar. In 1939, in just the same way, he



49. First upper molar of *Gigantopithecus* (*right*) compared with the corresponding tooth in man.

finally added to his collection another third lower molar, much better preserved than the first, for it still had the root as well as a perfectly intact crown. All these teeth, while undoubtedly belonging to a primate, were twice as big as those of an adult male gorilla. If the rest of the giant were in proportion it must have stood between 11 and 13 feet high.

Was it man or ape? It is hard to say; for the teeth of men and the larger anthropoids are much alike. On the evidence of the first tooth, damaged though it was, von Koenigswald named its putative owner *Gigantopithecus*, or "giant ape." But the German scientist Franz Weidenreich, who made a careful study of the three teeth at von Koenigswald's request, observed that their crowns were less finely indented than an anthropoid's and were more like a man's. He therefore thought that *Gigantanthropus*, or "giant man," would be a more suitable name.

A considerable difference in size between creatures belonging to the same zoological order usually involves numerous variations in the details of their anatomy. The distinction between ape and man here seems premature. Perhaps it is even meaningless. After all, we have many more relics of the Pithecanthropus than a handful of teeth, yet scientists still cannot agree whether to call it man or ape. It is therefore more

prudent to say no more than that the Gigantopithecus was a giant ape-man.[1] But no one can dispute Weidenreich's words when he writes:

> This man-beast must have struck with terror all who looked upon him. His stature and constitution were double that of the gorilla.

Where did this monster live?

Von Koenigswald established that the fossil teeth usually found with those of the Gigantopithecus in the Chinese chemists' collections were those of the tapir, the orang-utan and of the Stegodon, an elephant belonging to the beginning of the Quaternary era, whose remains have been discovered in the muddy soil of certain caves in southern China, south of the Yangtze. In the cavities of the teeth were found particles of yellow earth, which, according to the researches of Father Pierre Teilhard de Chardin and other palaeontologists, are characteristic of these sedimentary deposits. They are variously dated in the Middle or Lower Pleistocene. On the strength of this geological evidence it has been asserted that the giant lived some 500,000 years ago in caves in the Chinese province of Kwangsi. Actually it could, geologically speaking, be much later and have lived barely 100,000 years ago.

Von Koenigswald's discoveries about giants did not end there. After his sensational find of new remains of the Pithecanthropus in Java, he followed up these excavations, organised with the help of the Dutch Government, in the same island in 1941, by digging up a fragment of an enormous jaw-bone in which there were still three teeth. They were even more human in appearance than those of the Gigantopithecus, but were only three-quarters of the size. The creature to which they belonged must, by this reckoning, have stood between 8 and 10 feet high. It was duly christened *Meganthropus palaeojavanicus*, the Great Man of Old Java.

A further palaeontological discovery proved that the giant's domain stretched farther than anyone had dared to imagine. In April 1948 J. T. Robinson, assistant to Dr Robert Broom of the Transvaal Museum,

[1] The recent discovery of a jaw-bone belonging to the Gigantopithecus in a mountain cave in Kwangsi Province, South China, settles the controversy. Dr Pei Wen-Chung of the Laboratory of Vertebrate Palaeontology, Academia Sinica, who studied the jaw-bone, reports in the *American Anthropologist* (October 1957) that it is definitely of an ape, not a man. It is between 400,000 and 600,000 years old (Middle Pleistocene period). Wear on the teeth shows "the animal had a mixed diet of meat and vegetables, quite different from that of modern apes which live on fruit." Dr Pei adds: ". . . this anthropoid was closer to man than any other ape yet discovered. It is estimated to have had a height of some 12 feet."

unearthed in a cave at Swartkrans, in South Africa, the larger part of a huge jaw-bone, still containing three premolars and four molars. Nearby were an upper wisdom tooth, two incisors and an upper canine tooth.

50. Fragment of the jaw of *Meganthropus* (*left*) compared with the corresponding piece of a human jaw.

The jaw was very slightly smaller than that of the Meganthropus. The premolars were one and a half times as big as a man's, but strange to say the incisors and canines were of the same size as the corresponding human teeth. Dr Broom called this African cousin of the Meganthropus, closely related to the little Australopithecus of the same region, by the name of *Paranthropus crassidens*. It is the best known of all giant primates. In 1949 and 1950 Broom and Robinson unearthed a good dozen fragments of its bones, including two almost complete skulls and a pelvis which showed that the creature stood more or less erect. Unfortunately the bones were embedded in chunks of extremely hard red sandstone, and dynamite had to be used to get them out. Naturally they were damaged and most of the pieces were crushed and shattered.

Nevertheless the general structure of the Paranthropus's face emerges very satisfactorily from a study of these fragments. It did not have such a prominent muzzle as the anthropoid ape's. Its face was broad, fairly flat and apparently almost noseless. By far its most striking feature were its huge jaws, which contrasted oddly with its relatively small cranium. It is not therefore surprising to find that this huge-jawed creature had a crest along the top of its skull like that to be seen on old male gorillas, for these crests are closely linked to the muscular strength of the jaw, the terminal tendons of which are attached to the parietal bones near the top of the skull.

From the dimensions of the jaw-bone and the remaining parts of the skull, Broom estimates that the cranial capacity of *Paranthropus crassidens* is more than 900 cubic centimetres.

> Quite possibly the brain of a large male Swartkrans ape-man may be over 1,000 c.c., and thus as large as the brains of Leibniz or Anatole France.

He thus concluded that he had at last found the true "Missing Link" between the apes and man. But, one may object, it signifies nothing

that a giant should have a larger brain than man; whales and elephants have much larger brains but their intelligence certainly is not in proportion. No doubt it was in order to forestall this objection that Dr Broom later denied that his Paranthropus was a giant, with the implication that neither were its cousins from China and Indonesia. According to him the creatures whose huge jaws and teeth have been found were comparable in size to a man or at the very most to a gorilla, and differed only in having abormally developed jaws.

An examination of the skulls of the Paranthropus shows that their faces were no higher than a man's. But as Weidenreich pointed out in *Apes, Giants and Man,* the last book he wrote before he died,

> In most cases, and especially in the Primates, large teeth necessitate large jaws, and large jaws necessitate a large body, as we know from fossil giant lemurs of Madagascar.

Therefore until there is proof to the contrary it seems more reasonable to suppose that the Swartkrans Paranthropus is a large ape-man with powerful jaws and a relatively small brain. As to the giants of Java and China, there is no proof that their jaws were disproportionately large since we still know nothing about the formation of their skulls. But even if the Gigantopithecus had a disproportionately large jaw, Broom himself admits that it would stand between 8 and 10 feet high. Can it not still be called a giant?

Finally Weinert reported in 1950 the discovery made by Dr Kohl-Larsen in Tanganyika in 1939, but not published or studied owing to the war. Twenty-five miles north of Lake Eyasi this German doctor found in upper Quatenary deposits the remains of a palate, nasal bones and jaws of a giant primate. As the molars were comparable in size to the Meganthropus's molars, Weinert considered it as an African cousin of the Java giant and called it *Meganthropus africanus.* All the same I think it much more likely that it is more closely related to the Paranthropus, a fellow-African, than to the Indonesian Meganthropus.

The discovery of authentic remains of prehistoric giants has revived a very old riddle, which has always puzzled the learned. It concerns this passage from Genesis:

> And it came to pass, when men began to multiply on the face of the earth, and daughters were born unto them, that the sons of God saw the daughters of men that they were fair; and they took them wives of all which they chose.

> And the Lord said, My spirit shall not always strive with man, for that he also is flesh: yet his days shall be an hundred and twenty years.
>
> There were giants in the earth in those days; and also after that, when the sons of God came in unto the daughters of men, and they bare children to them, the same became mighty men which were of old, men of renown.

It is not really surprising that the ancient Jews should have thought that giants, or *nefilim* as they called them, were the offspring of women and the strange "sons of God" who seem so incongruous in the sacred books of a monotheistic religion. For primitive people it is a natural step from greatness in size to greatness in spirit; and this change contributes to the distorted interpretations which historic events undergo in the course of thousands of years.

The point for us about Moses's text is that the oldest chronicles report that man lived on earth at the same time as a race of man-like giants. The Pentateuch is not the only work of antiquity to mention the existence of giants. According to Brahmin mythology a whole hegemony of giants preceded the advent of the primitive red race which founded the present human civilisation on the southern continent. This version is very widespread and has been believed all over the world since time immemorial. And stories of giants—usually man-eaters—are found in the folk-lore of all the peoples on earth. They are always considered as man's worst enemy and all the purest heroes of legend have a victory over some giant or other to their credit. Ulysses blinding Polyphemus's one eye, Sinbad the Sailor following his example, Odin and Ymer, David and Goliath, the battle of the Hottentot warriors and the great *Haitsi-Aibab*, "He-who-hurls-to-the-ground," the stories of gigantic bogy-men that are told in America from Peru to the country of the Eskimos, the fear of *Asourikes* in Siam, of *Assouras* in India and *Aessouri* in Mongolia, the processional giants that are part of the folk-lore of so many towns in Europe (Gog in London, Druon Antigon in Antwerp, Gayant at Douai and so on), are not all these fables based on the memory of battles which our ancestors actually fought with giants more than twice their size?

Sceptics have never failed to counter these legends with the complete absence of tangible remains. Where were the bones of these giants? At first they were improvised. Empedocles found fossil elephant-bones in Sicily and was misled by the single hole formed by the joined nasal fossae into thinking it was a Cyclops. In the Middle Ages a surgeon called Mazurier went all round France with a Mastodon's skeleton

found in the Dauphiné which he said was that of Teutobochus, King of the Apes. As comparative anatomy progressed and palaeontology was born, scientists soon exploded these errors. They remained obstinately against the giants, until quite suddenly official science came to provide arguments for those who believed in the truth of legend and biblical infallibility.

Von Koenigswald's and Broom's giants would have left an indelible mark in the memory of ancient man. These huge brutes, not yet entirely graduated from bestiality, must have made life hard for our ancestors. Weidenreich and von Koenigswald would have it that we are their direct descendants, but this is as absurd as to suppose that a Diplodocus could have given birth to the small lizards of today.

Quite apart from the question of size, there is no reason for thinking that these creatures had human intelligence. No doubt they were no more than clumsy and monstrous sketches for man which were swept aside just because they were so ill-adapted. Perhaps the gorilla and orang-utan may even owe the fact that they have not been totally exterminated to cunning greater or at least equal to that of these giant primates. The offspring of the sons of God and the daughters of men must have been very stupid, to be dethroned by puny little men.

No doubt these stupid or too peaceable great brutes, weary of always being beaten by man, gradually fell back into country where their adversary could not reach them. For giant apes, still agile but no longer able to live in trees, mountains were evidently the most suitable habitat and safest refuge. For the Gigantopithecus which used to live in China, the high Himalaya was the obvious shelter. There, out of reach of their enemies, they could have survived until today, just as their contemporaries have survived in the marshy forests of Borneo and Sumatra. This theory, which is utterly hypothetical, provides the only entirely acceptable explanation of the mystery of the abominable snowman.

Similarly, if we suppose that the Meganthropus of the Sunda Islands had also taken to the mountains—especially those of Sumatra—it would also explain the mystery of the giants in that island. For rumours very similar to the Himalayan ones are reported there, and human-looking footprints with an unusually large big toe have been found in the mud. These prints were enormous: about 2 feet long by 8 inches wide. A native who claimed to have seen an *orang gadang* (big man), which was supposed to have made the footprints, put its height at 10 feet; it was

built like a man, and had long hair on its head, but otherwise its skin was bare. All that is certain is that the Rajah of Rokan has examined this creature's footprints himself.

I had already related the legends of Himalayan ogres to von Koenigswald's discoveries for some time when in December 1951 the first photographs of clear footprints of the snowman were published. I took the opportunity to write a series of articles on unknown animals which appeared in *Sciences et Avenir* (Paris) in the following January, March, May and August. In the issue of May 1952 I published the gist of what I have written above, and put forward for the first time my view that the snowman was a giant and biped anthropoid no doubt closely related to the Gigantopithecus. At this time scientific opinion almost unanimously rejected the idea that the snowman was an unknown animal. Apart from Sir John Graham Kerr, who gave the *yeti* the benefit of the doubt, all the zoologists who expressed an opinion tried to identify it with some known animal and were not sparing in their sarcasm of those who put any faith in the Himalayan legend. Nobody took much notice of me.[1]

But little by little opinion began to change as the conquerors of Everest brought back the same persistent rumours, Sherpas gave more detailed accounts, a lama claimed to have examined the mummified remains of what he called "big monkeys," and Sir John Hunt himself declared after his interview with the second senior lama at Thyangboche: "There is an interesting problem for an enterprising party to investigate."

By the end of 1953 scepticism was breaking down, and scientists in several countries thought that it was possible that the Himalayan giant might exist and be a new and unknown species. The *Daily Mail* decided to send an expedition to look for the abominable snowman. When this news was announced a Pole called Slavomir Rawicz, who had settled in the Midlands and married an Englishwoman, came out with a strange account which was taken down by Ronald Downing, a *Daily Mail* reporter, and printed in that newspaper. Subsequently Rawicz's entire story was published under the title of *The Long Walk*. Eastern travellers have been very sceptical of this tale, and Rawicz offers not the

[1] But two years later, on 20 February 1954, a Russian zoologist called Wladimir Tschernezky published an article in the *Manchester Guardian* putting forward a theory identical with mine, down to the details of the argument. A completely revised version of it was included as an appendix to Izzard's *The Abominable Snowman Adventure* in 1955. The fact that we have both independently come to the same conclusions should add weight to our arguments.

slightest guarantee of his veracity. All the same, although no one has come forward to corroborate any part of his story, certain details in his description of the *yeti* are remarkably confirmed by evidence that has come to light since.

At the beginning of 1941 Rawicz was sent as a political prisoner to Soviet Labour Camp No. 402 in Siberia, some 200 miles north-west of Irkutsk and Lake Baikal. One day seven prisoners managed to elude their guards' vigilance and escape. Then began the long walk. They covered more than 2,000 miles on foot in country where nature was even more hostile than man. They crossed Mongolia, Sinkiang and Tibet, and in June 1942 the four survivors, indescribably thin and exhausted, were taken in by Indian soldiers.

In May 1942 there were still five of them and they were near the frontier of Sikkim and Bhutan in the narrow Chumbi valley which leads from Tibet into the Indian plains. When they saw two black dots moving over the snow in the distance they hurried towards them, in the hope of catching some creature they could eat. But when they reached an overhanging rock about 100 yards from the two creatures and 12 feet above them, they saw their hopes were vain.

They were massive creatures, nearly 8 feet tall and standing erect. They were shuffling around on a snow-covered shelf which formed part of the obvious route for us to continue our descent. Armed as we were with only one knife and one axe the whole five of us together would have stood no chance against them.

We thought perhaps they would go away if we waited. It was obvious that the pair had seen us. They looked at us and were quite indifferent. They certainly were not frightened of us.

I wanted to climb down the rock and get a little closer but my companions refused to join me. So we just sat there, our legs dangling over the edge of the rock, and watched them.

For two hours we watched them. One of the party said that if we waited long enough we should be bound to see them descend on all fours. But they never did. They moved around quietly on their hind legs with an almost comical swinging motion.

As a regular officer in the Polish Army in 1939 I was specially trained in assessing distances and heights for setting gun sights. I have not the slightest doubt that they were at least 7 feet high, but probably nearer 8 feet. One was slightly smaller than the other, and we decided they must be male and female.

Their faces I could not see in detail, but the heads were squarish and the ears must lie close to the skull because there was no projection from the silhouette against the snow. The shoulders sloped sharply down to a powerful chest and long arms, the wrists of which reached the knees.

Seen in profile, the back of the head was a straight line from the crown into the shoulders, as somebody remarked at the time, "a typical Prussian."

I tried to decide what they were and the nearest I could get was an idea of a cross between a big bear and an orang-outang type of ape.

The nearest I can get to describing their colour is a rusty camel. They were covered with a long loose straight hair, which, in the light, seemed to have a greyish tinge, but the bodies seemed to be covered also with a very short reddish fur.

They were doing nothing but move around slowly together and occasionally just standing and looking about them, like people admiring the view. So eventually we had to move off in another and more difficult direction.

On the way down the little party found half-blurred footprints of these creatures. They were more or less oval in shape and were about 20 inches long by 8 inches wide at their widest point. The change of route was fatal for one of the Poles: he slipped off a narrow ledge of rock and crashed to his death.

If we accept this story, what can we deduce from it? Firstly, that the animals were certainly not bears, for bears never stand on their hind-legs for long and, when they do, their front-legs are too short to come down anywhere near their knees. Moreover their ears stand up on the top of their heads and would certainly have been visible in their silhouettes against the snow. And they do not have particularly powerful chests. The only bear-like feature is their short and presumably thick fur. Everything else points to an anthropoid—which might well have adapted its coat to suit the climate.

The Prussian neck is most interesting. Old gorillas also have a thickened nape like a stiff-necked and muscular soldier. And it is clear that this effect would be exaggerated in an anthropoid which had become a permanent biped in order to save its precious hands from painful contact with the frozen ground. Most monkeys have a very concave nape of the neck as a result of holding up their heads when walking on all four legs. This makes them look a little hunchbacked. The *yeti*'s remarkably straight neck no doubt implies that it is a biped of very long standing—which would confirm the deductions I have already made from its primitive plantigrade foot, with no marked sign of having derived from a tree-dweller. May not the snowman, unlike all the primates but man, have by-passed this stage? Yet the long arms seem to imply that once it swung from branches like the larger anthropoids. Perhaps the *yeti* developed into a giant so soon that its life in trees had not entirely left

its mark upon it before it had to take to the ground. This may be why its big toe is so slightly separated from the smaller ones.

On the other hand, the *yeti*'s long arms could be not a sign of a past life in trees but a necessary consequence of being a biped. A man's skull sits upright with the centre of its base resting on the spinal column, which is curved in the small of the back so as to stand erect; very straight legs complete the tall but perfectly vertical structure. A monkey, as I have already remarked, is very ill-balanced when it stands on its hind-legs, and is obliged to use its arms as crutches or as balancing rods. Perhaps the *yeti*'s ancestors used their long arms as balancing rods before they learnt to walk quite upright like man.

Being a long-standing biped would have a much more important effect on the Himalayan giant than merely giving it a stiff neck. In the evolution of mammals and in their individual growth there is a very clear opposition between the development of the occipital part of the skull which contains the brain and the facial part which includes the jaws. An upright position allows the brain to develop freely on the end of the spine rather like a flower on its stalk, while the jaws are confined and inhibited by its growth. But when the body is horizontal, as in quadrupeds, the brain is compressed between the spine and the facial part; the jaws, on the other hand, can lengthen into a snout. In other words, it is impossible to have the large spherical brain that goes with higher intelligence at the same time as a beast's snout; and the preponderance of the one over the other is related to the angle of the body. Thus monkeys, which use their hands to climb in trees and tend to be in a half-upright position, are half-way between man—a complete biped—and the quadrupeds with their horizontal bodies. Those monkeys—baboons and the like—which have given up living in trees and become quadrupeds have much longer muzzles than the others and are known as Cynocephala or dog-headed monkeys. The Asian anthropoids—the gibbon and the orang-utan—unlike the African apes which often walk on the ground, live almost exclusively in trees. They are expert trapezists and have developed such long arms that when they come down to the ground they are still as vertical as when they are swinging from branch to branch. Their upright position ought logically to have favoured the growth of their brains and inhibited that of their jaws. This is what one finds, but it is not very noticeable, because they have retained, from having once been quadrupeds, a very backwards position of the occipital condyles, which form the articulation between the skull and the spinal column. Therefore, unlike man's, their skull does not

sit in equilibrium on the top of the spine, but is as it were stuck on in front of the body. They have in fact taken the wrong road towards standing upright. Nevertheless the orang-utan and the gibbon have higher, rounder foreheads than their African cousins, and their jaws, after growing forwards, have begun to grow downwards as a result of the change in angle of their bodies. This is most striking in the orang-utan, the most different from the other apes of the two, which once it is adult has a thick and heavy jaw, as well-developed in height and breadth as in length.

The *yeti*'s evolution must have run in the same direction as the orang-utan's, but, having become a biped much sooner, the downward growth of the jaw would have started at an earlier stage. Consequently one would expect to find not only a much higher forehead and very slight prognathism, but also considerable development in the depth and breadth of the jaws. Comparing this with the only giant primate of which we have a more or less complete skull, the Swartkrans Paranthropus (see reconstruction facing page 136), we find that its face is rather flat, and the development of the jaws, considerable though it is, is almost entirely in depth and thickness, hence the impressive size of the molars. If the snowman is closely related to the Gigantopithecus, as I believe it is, Professor Broom is right in thinking the Asian giant primates are not of a size proportionate to their teeth. According to his calculations the Gigantopithecus must have stood between 8 and 10 feet high, which, according to most witnesses, is about the height of the *yeti* and agrees with the size of its footprints. Thus it is legitimate to consider equating the two creatures.

If the snowman, then, like his African cousin the Paranthropus, had a remarkably over-developed masticatory apparatus, without any marked prognathism, he would have exceptionally powerful jaw-muscles and like him would have a considerable sagittal crest on the top of his already high skull, comparable to the crest of an old male gorilla.

This conclusion, reached by *a priori* argument and comparison with various known species, not only agrees with the Sherpas' accounts that the *yeti* has a pointed or conical head, but is also confirmed most strikingly by the discoveries of the *Daily Mail* expedition.

The expedition set off from Katmandu in January 1954. Including the Nepalese porters it consisted of some 300 men. Besides a veteran mountaineer John A. Jackson, the adventurous reporter Ralph Izzard, and a first-class camera-man Tom Stobart, who made the film *The*

Conquest of Everest, the team contained several scientists: Charles Stonor, former Assistant Curator of the London Zoo; Dr Biswamoy Biswas, a young Indian zoologist of the Zoological Survey of India specialising in mammals and birds, and Gerald Russell, an American naturalist who went on William Harkness's expeditions to central Asia in the 1930s and took part in capturing the giant panda in 1936.

Charles Stonor had already set off in December 1953 on a reconnaissance of the route to Namche Bazar, the Sherpa's capital, when he met a Sherpa of about 30 called Pasang Nyima, who said that he had seen a *yeti* three months before when he went to a remote area to take part in a religious ceremony in a sacred place. He heard that there was a *yeti* about and went off with several companions to investigate. When they reached the spot they saw the *yeti* some 200 or 300 yards away on a flat piece of ground sparsely covered with bushes. It was the first *yeti* Pasang had seen. According to him it was the size and build of a small man. Its head, its body and its thighs were covered with long hair. Its face and chest looked less hairy and there were no long hairs on the legs below the knees. The colour of the fur was "both dark and light" and the chest was reddish. It walked nearly as upright as a man and bent down occasionally to grub in the ground for roots. When it realised that it had been seen it gave a loud, high-pitched cry and ran off into the forest, still on its hind-legs, but with a sidling gait. Never once did it go on all fours. As all the villagers insisted that Pasang was speaking the truth, Stonor slyly asked him:

"Is the *yeti* a flesh-and-blood animal, or is it a spirit?"

To which the Sherpa replied with disarming logic:

"How could it have been a spirit since we saw its footprints after it had run away?"

Stonor went on collecting *yeti* lore and soon had several other first-hand accounts of the beast's appearance.

One afternoon in 1947 or thereabouts a yak-breeder called Dakhu who lived in Pangboche saw one some 50 yards away. It walked upright, was the height of a small man and was stocky and covered with hair.

In March 1949 another Pangboche villager called Mingma heard something like a stentorian human cry while he was driving his herd to pasture, then he saw something among the rocks coming down towards him. He took refuge in a stone hut, but was able to see the *yeti* through a large crack in the wall and to examine it very carefully. Stonor reports his description as follows:

> A squat, thickset creature, of the size and proportions of a small man, covered with reddish and black hair. The hair was not very long, and looked to be slanting upwards above the waist, and downwards below it; about the feet it was rather longer. The head was high and pointed, with a crest of hair on the top; the face was bare, except for some hair on the sides of the cheeks, brown in colour, "not so flat as a monkey but flatter than a man," and with a squashed-in nose. It had no tail. As Mingma watched it, the Yeti stood slightly stooping, its arms hanging down by its sides; he noticed particularly that the hands looked to be larger and stronger than a man's. It moved about in front of the hut with long strides. . . .

When the beast saw that it was being watched through a crack it growled and showed its teeth; Mingma was very struck by their size.

In about 1950 Lakhpa Tensing saw a *yeti* sitting on a rock some 30 yards away. It turned its back to him. It seemed to be the size of a small boy and was covered with rather light reddish hair.

And in October 1952 a villager from Thamnu called Anseering and his wife surprised a *yeti* among the rocks when they were going to collect medicinal roots at the upper edges of the forest. The animal was dark brown, smaller than a man and thick-set. It made off, climbing over the rocks on four feet.

All these accounts, and also the elder Tenzing's, Sen Tensing's and Pasang Nyima's, agree most strikingly. But some of the tales Stonor heard seemed to refer to creatures which had little to do with the snow-man. So he came to the conclusion that there were two types of *yeti*, the larger being the Himalayan red bear, a fairly rare animal in those parts, but the smaller was the creature they were looking for and that everything pointed to its being an ape. He decided that they should concentrate on it entirely. His theory of two unknown creatures was based on linguistic inquiries. *Yeti*, he found, was derived from two Tibetan words, *yeh* (rocky area) and *teh*—which he did not define. The largest of these *yeh-teh* was called *dzu-teh*, and seemed to be the Himalayan red bear. It went on all fours and had long shaggy reddish hair. *Dzu* meant "livestock" and Stonor thought that *dzu-teh* therefore meant a *teh* that was dangerous to cattle. Then there was the *mih-teh* which was the size of a fourteen-year-old boy but as heavily built as a man. It was covered with light reddish hair and had longer hair on its strikingly pointed head. *Mih* meant "man" and Stonor was uncertain whether the *mih-teh* was so called because it was dangerous to men or because it was like a man. The first alternative seems most unlikely since he goes on to remark:

There is no certainty about its food, but many people believe it to live on rock-rats (*picas*) and other small beasts which abound in its home. It is not thought to be particularly aggressive towards man, but is very shy and very intelligent.

Let me digress a moment to clear the philological problem of the snowman's many names out of the way. Prince Peter of Greece, who knows the Himalaya well, was the first to explain what *teh* meant. "It is, I believe, a rather vague colloquial term for 'brown bear' (spelt *dred* and pronounced *t(r)e*)." He added that in the Kalimpong area where he was living *mi-go* (wild man) was the usual Tibetan name for the snowman.

A really thorough philological study of the problem was published in 1955 by an Indian scholar Sri Swami Pranavananda in the *Journal of the Bombay Natural History Society*. He confirmed that *tre* (with the *r* so softly pronounced as to be almost inaudible, thus making it *te* or *teh*) was indeed the name for the brown bear. He explained that there were three bears known to the Tibetans: the black bear which they called *tom*, the brown bear called *te*, and the *mi-te* or "man-bear" (from *mi*, "man," and *te*, "bear") so called because it walked on its hind-feet like a man. Pranavananda asserted that this is certainly the red bear, adding: "Since the *mi-te* walks sometimes on all fours and sometimes on hind-legs only, it is but natural that the tracks of footprints are sometimes seen in pairs and sometimes in single files."

He went on to say that the name of *metoh kangmi* (from *metoh* or *meteh*, "abominable," *kang*, "snow" and *mi*, "man") was an unjustifiable conjunction of different names for the red bear: *mi-te* (man-bear) and *kang-mi* (snowman), the former having been misunderstood and mistranslated. The term *mi-go* usually translated as "wild man" according to this Indian scholar actually meant "beast that walks like man" and was the name for the snowman in Tibetan provinces of Amdo and Kham (which are now part of China) and was also used by the Tibetans on the Indian frontier with Kham. As for *yeh-te* (*yi-te*, *yih-dah* or *yeh-da*) it was a quite mythical creature "with the throat as thin as a needle and stomach as big as a mountain, hence a glutton."

Sri Swami Pranavananda's article was welcomed by the sceptics. Newspapers reported that the legend of the abominable snowman had been exploded once and for all. And the distinguished anthropologist William L. Strauss, Jr., of Johns Hopkins University repeated the Indian scholar's conclusions in *Science* with evident satisfaction.

Actually Pranavananda would have done better to have stuck to the

linguistic side of the problem, for his zoological conclusions are quite absurd. There are only two known species of bear in the high Himalaya: the black or collared bear (*Selenarctos thibetanus*) and the local variety of brown bear known as the red bear (*Ursus arctos isabellinus*). It is true that in Tibet and Kansu there is another variety of brown bear called the blue bear (*Ursus arctos pruinosus*), but it does not spread as far as the Himalaya. So if the *mi-teh* is a third bear, even more mysterious than Graham Greene's *Third Man*, in these great mountains, it must be an unknown species. And if this third bear really walks on its hind-feet as often as its name implies, and does so for miles at a time as its tracks show, it is a truly extraordinary bear, much more extraordinary to the zoologist than a large biped ape.

From Pranavananda's article we can conclude that the people who live in the Himalaya know a creature which they call *mi-teh*, probably because it resembles both bear and man; no doubt it is the same beast which in some areas is called *mi-go* because it walks like a man, and in others *kangmi* because it sometimes leaves tracks in the snowfields; lastly it is often nicknamed *yeh-te*, a word originally meaning an all-devouring demon, just as we sometimes call an actual but particularly savage and voracious beast a monster.

If Pranavananda has really unmasked the snowman he has revealed that it has a much more agreeable face: it was originally called abominable in error and unjustly maligned ever since.

Continuing his reconnaissance Stonor finally found some tracks of the *yeti* 14,000 feet up near Namche Bazar. They were the human-looking footprints so often seen by travellers, but smaller than any reported before: the average length was 10 inches, the maximum width 5 inches and across the heel 3 inches. Stonor was much encouraged.

"My own view," he wrote, "is that we are concerned with some quite unknown and extremely interesting beast."

When the main body of the expedition had arrived and were split into three columns so as to search the largest possible area, more *yeti* tracks were soon found. Jackson and Jeeves went up the Khumbu glacier and discovered one two or three days old which had undoubtedly been made by a biped. The prints were 10 to 11 inches long by 5 to 6 inches wide.

In the upper Dudh Kosi valley Russell and Izzard came upon a second trail, little fresher than the first. The prints were even smaller, having originally been some 8 to 9 inches long by 4 to 5 inches broad. At the edge of a plateau they could see that this usually biped animal had

dropped on all fours, no doubt to reconnoitre the ground more cautiously, thus making "smaller indentations" with its hands and knuckles. The two men followed the trail until they were forced to abandon it: but they picked it up again at the top of Lake Lang Boma. Here they were disconcerted to see that it seemed to have been made by a quadruped until it split to go round a boulder, when they realised that it had been made by two bipeds, a second *yeti* had been following in the first's tracks. They followed the trail for some 8 miles and found signs that the animal liked to slide down snowy slopes on its behind, a very playful pastime for a creature that had been called abominable.

Several days later they found a third and then a fourth trail of footprints, very similar in size to the smaller of the tracks they had found before, then they found some more, and yet another trail, so that Izzard wrote to the leader of another column, "You will excuse us if the report of a *single* Yeti's tracks now leaves us rather cold."

Meanwhile members of the expedition also found occasional heaps of excrement along the trails they were following. On his reconnaissance Stonor had twice found a large animal's droppings containing fur, rodents' bones and a certain amount of earth. The natives that he had asked had all unanimously told him that the *yeti* ate small mammals that lived among the rocks (marmots and pikas or "mouse-hares") and large insects, besides consuming clayey earth "perhaps for bulk or for some mineral value." Only a few of the natives thought that the beast also preyed on young yaks, tahr and musk-deer as well as on birds and their eggs. Gerald Russell's analysis of *yeti* droppings left no doubt that it was omnivorous:

> a quantity of mouse-hare fur; a quantity of mouse-hare bones (approx. 20); one feather, probably from a partridge chick. Some sections of grass, or other vegetable matter, one thorn, one large insect claw, three mouse-hare whiskers.

Unfortunately although the three columns moved in pincer movements for 15 weeks the *Daily Mail* expedition did not succeed in seeing a single specimen of the elusive animal, at least not for certain, let alone watching it carefully, photographing or capturing it. But they did not draw a complete blank, as Izzard's and Stonor's books prove.

The most interesting information they collected was about the various scalps supposed to belong to the *yeti*. It will be recalled that the lama Chemed Rigdzin Dorje said that remains of snowmen were venerated as relics in several monasteries and that he had seen two of them

himself. Relations with Tibet were so strained that it seemed unlikely that Western scientists would soon be able to check his assertion. But on 9 October 1953 a group of four mountaineers, Rusi Gandhy, J. A Gaitonde, P. V. Pattankar and Navnit Parikh of the Bombay Natural History Society, stopped on their way back from an expedition at the monastery at Pangboche, 5 miles beyond Thyangboche in the direction of Everest. The monks there told them that there was a *yeti*'s scalp in the local *gompa* (or small temple), and after a good deal of hesitation showed it to them and to Dr Charles Evans of the successful British Everest expedition, who happened to be passing. An Austrian anthropologist, Professor Christoph von Fürer-Haimendorf, was also present. The Indian mountaineers photographed this oddly conical specimen, and the head lama kindly presented them with a single hair, which was sent to the world's greatest expert on the subject, Dr Leon A. Hausman, professor of zoology at the New Jersey College for Women at New Brunswick.

He found on a first examination under the microscope that "the structural elements of the hairshaft agreed with those of an *Ursus* or of an anthropoid of some sort (not *Homo*)." But though he compared it with the hairs on the head and back of a langur, a brown bear and even a takin it did not agree with any of them. He then burked the question by stating that from the photograph it might after all be a "moulded and sewed artifact" brought there by some traveller. The hair might therefore come from a species that was not Tibetan, which, he said, made it impossible to identify it.

This statement is obviously far too categorical: it shows that Dr Hausman was either unable to identify the hair with that of any known species, or that he did not want to waste time examining what he thought, for no good reason, was a fake.

During his reconnaissance Stonor was eventually able to lay his hands on this relic of the *yeti* and learnt that it dated from the fifth reincarnation of San-Dorje, the lama in whose honour the *gompa* was founded. The present lama was the twelfth reincarnation. Every lama was chosen as a child and remained in office until his death, so, allowing 50 years for each reincarnation, the scalp would be about 350 years old.

Naturally Stonor was not allowed to take this holy relic away—the most he could do was to remove several hairs and send them to London to be analysed—but he took some excellent photos (see plate facing page 137) and gives a very detailed description of what he believed to be a true scalp.

It is quite obviously the skin from the top of the head of an animal, cut off symmetrically above the ears (of which there is no trace). The inside surface is quite clean and absolutely entire, in that there is not the faintest possibility of its having been sewn together or fashioned into shape. I was utterly unable to identify it with any animal known to science.

It was $7\frac{1}{2}$ inches high, $9\frac{3}{4}$ inches long and $6\frac{3}{4}$ inches wide. The length from back to front over the crown was $17\frac{1}{4}$ inches. The circumference at the base was $26\frac{1}{4}$ inches. All these measurements are larger than those of a man. Thus the circumference of an adult man's head averages 21 inches and the length of the medial line of the skull rarely exceeds 13 inches. The thickness, $\frac{1}{8}$ inch, was also remarkable.

The texture is that of brittle leather: quite uniform throughout, and the skin blackish in colour. . . . The shape at the base is a broad oval: it may be slightly misshapen from age and usage . . . but in view of the very tough texture, I do not think this to be the case.

The outer surface is now largely bare and the skin fairly smooth: but it was quite clearly covered with hair in its original state and is still minutely pitted all over with hair bases. A fair proportion of hair still remains. The hair is foxy-red in general colour, barred with blackish-brown. The individual hairs are a very few inches in length and are extremely stiff and bristle-like. It is impossible to say if there were formerly hairs of greater length. From what is presumably the forehead the hair slopes backward, and slightly downwards along the sides, much as in man: while at the back of the head it slopes almost vertically downwards. This is quite noticeable and I think it to be the natural conformation.

An extraordinary feature is a crest or "keel" which runs from the base of the forehead straight upwards over the crown and down the back. It has a uniform width of almost exactly one inch. It is covered with bristle-like hairs of the same colour as the rest, which are no more than 1·25 in. in length and which slope inwards from each side so as to meet in the centre and form a crest, which is thus triangular in cross-section. In common with the rest of the hairs much of the crest is gone, but it is distinctly marked as a slightly raised ridge in the skin.

When Dr Biswas, who was also a professional naturalist, examined the Pangboche scalp soon afterwards he also categorically confirmed Charles Stonor's view that it could under no circumstances be false or imitation. Only the ciné-cameraman Tom Stobart had doubts. "Personally," he said, "I would not rule out its being a 'made article.' When one considers the shrunken heads made in South America it is by no means impossible. I should think that a boar would supply the basic materials." I shall discuss this question later.

When the expedition visited the Thyangboche monastery, the head lama, with whom they had made friends, told them that there was a second *yeti*'s scalp at the lamasery at Khumjung, 2½ miles away. This proved on examination to be the same size as the first, more battered and with scantier fur. According to the tradition the two scalps had come from a pair, the Pangboche one from a male and the Khumjung one from a female.

Despite much bargaining the monks would not lend either of the scalps to the expedition, but their friend Sanghi Lama got them a piece of skin 3 inches long by 1½ inches wide which he said had come from an entire *yeti*'s skin that had long belonged to the village of Khumjung but had recently disappeared in mysterious circumstances.

The expedition was subsequently able to examine a third *yeti*'s scalp in the temple at Namche Bazar, but it turned out to be merely a faked version of the other two: it was made of pieces of hairy skin, identical with that of the true scalps, but sewn together to form the same shape as them. Doubtless it had been made to satisfy Namche Bazar's local pride. Izzard suggests that "An impious thought is that possibly the Namche Bazar scalp is the explanation of Khumjung's missing hide."

Professor F. Wood Jones, the expert in comparative anatomy who examined some hairs from the Pangboche scalp in London, said that he was unable to determine what animal they came from. After comparing them with those of an orang-utan and a black bear, he was convinced that they were not those of an anthropoid ape nor of a bear, but thought they might come from the shoulder of some coarse-haired hooved animal, not from its head. In his opinion the hairs and the photographs showed that it was not a true scalp, for he did not believe that any animal would have a crest running from the base of the forehead right across the top of the head and ending at the back of the neck.

The *Daily Mail* team were discouraged by this pronouncement. But in fact one could hardly hope for an opinion more favourable to the scalp's authenticity. For it is clear enough that the scalp of a huge biped anthropoid ape, a sort of animal as yet unheard of, would have to be quite original in structure. One should not be in the least surprised to find that it had a raised crest of standing hair. The ridge along the crest of the scalp indicates that there was a bony sagittal crest beneath it, and this, as I have shown, is what we should expect to find in a giant biped primate closely related to the Gigantopithecus. The *yeti* must therefore be like the Paranthropus, a primate with a heavy and powerful but not

very prominent jaw. This is also confirmed by such witnesses as Tenzing's father and the yak-herd Mingma, who were struck by the size of its teeth. Clearly its very flat face and high forehead would give it a remarkably human expression. This would be accentuated by its crest, like a gorilla's, which in some individuals, old males no doubt, seems to be furnished with long hair looking like the hair on a man's head. Its biped gait would clinch the resemblance and justify the name of snowman.

Thus the unusual shape of the alleged *yeti* scalps agrees better than one could possibly have hoped with what I deduced the beast must be on the evidence of its footprints alone. To make quite certain, I set about trying to find out if it would be possible to make a fake scalp from the shoulder of some hooved animal.

Let me explain at once that it would be by no means essential to use the skin of a hump, like a camel's or that of an Indian humped ox, to produce a sort of conical mitre. Suitably moistened and stretched on a mould any piece of flat skin could be made this shape. Nevertheless a study of the skins of camels, various cattle, including the yak and the Indian humped ox, and of wild boars, convinced me that the skin of the shoulder or back of these animals could not have been used to make the Pangboche and Khumjung scalps. There is no need even to refer to the texture of the hair (which rules out creatures like the camel and yak which have characteristically woolly coats) in order to settle the question. In fact no quadruped's back can provide a skin from which these scalps could be faked, for the hair-tracts are arranged in quite a different way. It would be utterly impossible. On a quadruped's back the hairs all point towards the hindquarters, parallel to the median line in what is technically called "the primitive cranio-caudal stream": and even if there happened to be a tiny spiral hair whorl, on the top of the shoulder

51. The arrangement of hair-tracts on (*left*) a quadruped's back, (*centre*) the supposed snowman's scalp, and (*right*) a gorilla's scalp. In all three diagrams the animal is facing towards the top of the page.

for instance, this would not alter the general direction of the hairs. On the other hand, the hairs on the alleged snowman scalps begin parallel to the median line on what is thought to be the forehead, soon turn at right angles to it and remain at an angle until the nape of the neck where they return to their original parallel direction. Since these scalps have crests of standing hairs it is obviously impossible that they could be made of the skin of any part of an animal's body except the skull, the nape of the neck and the back.

As a comparison I examined the skin on the heads of several large apes, and found that the pattern of hair-tracts was much nearer to that of the Pangboche and Khumjung relics. In the orang-utan the hairs spread out in all directions from that part of the back of the head known as the great fontanelle, like the hair-style affected by some monks, many Amazonian Indians, the ancient Romans and Marlon Brando (early period). They spread out on the sides of the head, but point forward on the top of the head; and in this they are different. In the gorilla on the other hand the hairs on the head are arranged like those on the alleged scalps, even above the eye-sockets and on the forehead.

Incidentally I must contradict Charles Stonor when he says that the first scalp was "astonishingly thick," the actual thickness being $\frac{1}{8}$ inch; for I measured that of several gorilla-skins and found that they were always around $\frac{1}{8}$ inch (between 3 and 4 mm.).

The Pangboche and Khumjung scalps therefore offer all the guarantee of their authenticity that one could wish. The fact that the people of Namche Bazar did not succeed in making a fake which would pass as the real article, even with the aid of similar skin, provides an additional guarantee. I challenge those who have said that these scalps are fakes to concoct one out of the shoulder of some hooved animal or indeed from the skin of any animal they choose. The result may well be an attractive fur cap, but I am certain that not even the most shortsighted of experts would ever mistake it for a relic of the snowman.

Ever since the *Daily Mail* expedition the *yeti* has been in the news. In May 1955 the French expedition on Makalu (a 27,190-foot peak 13 miles south-east of Everest) came upon several tracks; one of them, on the Barun Col, had been made that very morning or late on the previous evening. The Abbé P. Bordet, the team's geologist, who photographed the imprints, produced indisputable evidence that the beast was a biped: even where the *yeti* had jumped down into the snow from a small wall of rock there "were no tracks of its forefeet."

I have followed a *yeti* track for more than a kilometre [he writes], and seen nearly 3,000 footprints. They are all of the same kind. They are deep marks made by a foot somewhat resembling a human foot. The sole of the foot is roughly elliptical and rounded underneath. In front of it are the more or less circular marks of four toes (not five), the first on the inside is larger than the rest and perhaps not quite so far forward, the other three lie on the front edge of the sole of the foot and very close to it. These toes are much larger than human toes. There are no marks of claws. . . . In the best imprints there are still little ridges of snow dividing the toe-marks and showing that the toes are slightly separated when the creature walks. The length of the footprints is about 20 centimetres. . . .

The animal walks with its feet almost parallel and only slightly splayed. Its stride was about 20 inches, a little less than my own on this slippery ground. . . .

The second track that I saw was that of an animal coming down to a lake, no doubt to drink there. The prints were in a perfectly straight line and the stride was much longer, sometimes as much as three feet.

All the same all these tracks were those of a biped which even in difficult conditions had no need to use its front legs.

Professors Berlioz and Arambourg of the Paris Natural History Museum, whom the Abbé Bordet consulted, admitted "there is no known animal which leaves such footprints, and none which is a true biped as this is." But they refused to draw any conclusions as to what it might be. "Whether it is a kind of bear or ape," Bordet concludes, "it seems too soon to decide, our information being what it is at present." This opinion shows considerable ignorance of the problem and the work that has been done on it. As I pointed out in 1952, one need only look at a track to see if the big toe is on the inside or the outside to decide whether it was made by a primate or a bear. Since the Abbé Bordet tells us that "the first on the inside is larger than the rest," the *yeti* cannot possibly be a bear, even if it is an unknown biped species. Bordet also points out, apropos of the *yeti*'s identity, the odd fact that:

> The Indian map of the Himalaya marks the area round Everest as the Mahalangur Himal (the mountains of the great monkeys). As no monkey is known to live there this name may refer to the *yeti*, a characteristic inhabitant in the natives' eyes.

A month later, on 12 June 1955, two members of the Royal Air Force Mountaineering Association expedition to the Himalaya, Wing-Commander A. J. M. Smyth, the leader, and Sergeant J. R. Lees, also found fresh *yeti* tracks 12,375 feet up in the Kulti valley. They summoned the transport officer Squadron-Leader L. W. Davies who came and

photographed the track and sent a signal about it to the Air Ministry. The official communiqué gives some interesting details.

> There were many prints, each measuring about 12 inches by 6 inches, and indicating that the creature who made them was two-legged, with five toes a quarter of an inch wide on each foot.
>
> The prints were sunk 11 inches into the snow, compared with the one-inch impression made by the R.A.F. mountaineers.

This shows that the creature which made such deep tracks must have been several times as heavy as a man. (A gorilla, by the way, rarely exceeds 40 stone.)

Less reliable than the Air Ministry communiqué is the agency report published in January 1956 to the effect that a snowman had been caught in a trap, killed with arrows and eaten by Naga head-hunters on the frontier between Assam and China. The creature was reported to be 10 feet high, white as milk and with human features. Although the incident itself is not improbable, the description of the beast killed seems so fantastic that one is tempted to write the whole thing off as a hoax. But this may be unjust, for a story told to a regional army officer and passed on to a group of Indian journalists travelling in the frontier area, must have been much altered in transmission especially if first told in a dialect very difficult to understand. The Naga Angami which the Naga speak, as R. B. McCabe has pointed out, is "still in a very primitive stage of the agglutinating class," and "peculiarly rich in intonation," although "for one Naga who clearly marks these tonal distinctions twenty fail to do so." It is easy to see what misunderstandings might arise in a translation from such a language.

Professor René von Nebesky-Wojkowitz, who spent three years of ethnographic research in Tibet and Sikkim from 1950 to 1953, tells several stories about the abominable snowman in his admirably documented book. They agree very well with those that Izzard and his companions heard in Nepal. He draws the following conclusions from the evidence that he had obtained by questioning many witnesses:

> It is a remarkable fact that the statements of Tibetans, Sherpas and Lepchas concerning the Snowman's appearance largely coincide. According to their description a warrant for the arrest of this most "wanted" of all the inhabitants of the Himalayas would read as follows: 7 feet to 7 feet 6 inches tall when erect on his hind legs. Powerful body covered with dark brown hair. Long arms. Oval head running to a point at the top, with apelike face. Face and head are only sparsely

covered with hair. He fears the light of a fire, and in spite of his great strength is regarded by the less superstitious inhabitants of the Himalayas as a harmless creature that would attack a man only if wounded.

To this description, which confirms in every detail what we know already, he adds some more interesting information about the creature's habitat:

> From what native hunters say the term "snowman" is a misnomer, since firstly it is not human and secondly it does not live in the zone of snow. Its habitat is rather the impenetrable thickets of the highest tracts of Himalayan forest. During the day it sleeps in its lair, which it does not leave until nightfall. Then its approach may be recognized by the cracking of branches and its peculiar whistling call. In the forest the *migo* moves on all fours or by swinging from tree to tree. But in the open country it generally walks upright with an unsteady, rolling gait. Why does the creature undertake what must certainly be extremely wearisome expeditions into the inhospitable regions of snow? The natives have what sounds a very credible explanation: they say the Snowman likes a saline moss which it finds on the rocks of the moraine fields. While searching for this moss it leaves its characteristic tracks on the snowfields. When it has satisfied its hunger for salt it returns to the forest.

This suggests that—as I suspected—the snowman owes the accidental fact that it is a biped to snow beneath its feet, and also that the places where the creature and its footprints are usually seen are not its normal habitat. If its desire for saline food is not the only cause that drives the snowman to venture into open country, where it is more likely to be seen, it is a strong enough reason to explain such journeys: moreover they are strangely reminiscent of the long pilgrimages that elephants sometimes make in search of saline soil.

In the spring of 1957 an American expedition led by a Texas oilman called Tom Slick also searched for the snowman in eastern Nepal. During three months wandering among the Himalayan foothills the leader collected much new data about the elusive animal. Not only did he examine three sets of footprints, excrements and even hairs that had come from *yetis*, but he also questioned some 15 Nepalese who claimed to have seen the animal. From all this information he inferred that the snowman must be a large ape like a gorilla or an orang-utan. It had a pointed head and walked upright like a man. It was strong enough to kill a yak with its bare hands, though it does not seem to eat these animals. On the other hand when it happens to kill a man it eats his

eyeballs, fingers and "other parts," but has no special taste for human flesh. Small rodents and bamboo shoots are its chief food.

Tom Slick's most important contribution to the problem is, I think, his belief that there are two kinds of *yetis*: one with blackish hair and about 8 feet high, and the other reddish and smaller. This conclusion is based on differences in the accounts he heard from the natives, on finding two kinds of hair along the tracks and examining two kinds of footprints. The largest, like those photographed by Shipton, were as much as 13 inches long; the smaller are more like a medium-sized man's.

This would explain the discrepancies that the reader cannot fail to have noticed in this chapter. While some witnesses say the snowman is a giant, all the Sherpas who have seen it say that it is smaller than a man or about the same size. It is significant that all the reports which say the *yeti* is a giant (Marquès-Rivière's pilgrim, the lama Chemed Rigdzin Dorje, Slavomir Rawicz and Professor von Nebesky-Wojkowitz's witnesses) come either from Tibet or from the very north of Sikkim or Nepal, that is from very high places on the edge of these countries. I should also mention that a teacher at Namche Bazar told Ralph Izzard that there were two kinds of *yetis*. Since this man, who had recently arrived from Darjeeling, was, according to Izzard, not "the most knowledgeable authority," the reporter did not take his remarks very seriously when "The larger lived 'there,' he said, pointing vaguely in the direction of Mount Everest, and the smaller 'there,' waving equally vaguely in the direction of the lower Dudh Kosi valley."

This opinion was confirmed in 1957 by a Tibetan lama called Punyabayra, high priest of the monastery at Budnath, who spent four months in the high mountains and brought back the surprising but valuable information that the Tibetan mountain people knew three kinds of snowmen: the *nyalmo*, the *rimi* and the *rackshi bompo*. The *nyalmo* are real giants, between 13 and 16 feet high, with enormous conical heads. They wander in parties among the eternal snows above 13,000 feet. In such empty country it is hardly surprising that they should be carnivorous and even man-eating. The *rimi* are smaller, but still between 7 and 9 feet high. They live lower down between 10,000 and 13,000 feet, feeding on plants as well, and are thus omnivorous. Their favourite place is the Barun Khola valley in eastern Nepal. The *rackshi bompo* are about the size of a man.

What are we to make of these distinctions? Some may say that they are the absurd supersitions one might expect a Tibetan lama to spread. But we should not forget that he is an educated man with the rare

privilege of questioning mountain people in the remotest parts of the Himalaya in their own language. Punyabayra also offered to capture a specimen of each kind of *yeti* if the Katmandu Government would help him. This is evidence of his sincerity. Moreover his account agrees in part at least with what we already know. The *rackshi bompo* must be the Sherpas' reddish *yeh-teh* or *mi-teh* which leaves the footprints 8 or 9 inches long that the *Daily Mail* expedition and the Abbé Bordet found in such quantity. The *rimi* must be the large black snowman described by Nebesky-Wojkowitz's Tibetan and Sikkimese informants, and the one whose mummified bodies Chemed Rigdzin Dorje saw in Tibet, and which leaves footprints 12 to 13 inches long. It was in fact in the Barun area or in eastern Nepal that Shipton and Slick found footprints of this size. The *nyalmo* remind one of Marquès-Rivière's pilgrim's sad-faced giants. Do they really exist, or are they just a myth? It is true that J. R. O. Gent spoke of footprints 18 inches to 2 feet long, which logically could only have been made by *yetis* even larger than the *rimi*. But here the evidence is far too slender for us to draw any satisfactory conclusions. Possibly the *nyalmo* are an invented addition based on the belief that *yetis* increase in size the higher you go.

Meanwhile we can say that the existence of two kinds of *yetis* of different size and colour is well-established. No doubt they are different geographic races of the same species. But it is also possible that they may be merely the result of sexual dimorphism. Old male gorillas grow so large that they can travel only on the ground, while the females still climb trees. Thus the male *yeti*—stronger, more heavily built and consequently better able to stand cold—might be the only one that could venture into the higher parts of the mountains to hunt. Nor is it impossible that the small reddish *yetis* may be the young of the large black ones. In gibbons the colour may change completely with age, from white with hardly a touch of grey at puberty to the deepest of blacks. Here again the *yetis* may go up to greater heights as they become tougher and stronger with age.

We can now even give a detailed description of the giant biped anthropoid of the Himalaya, a shy survivor of the empire of giant primates which once ruled a large part of the earth.

Only four giant ape-men are so far known to palaeontology: the Chinese Gigantopithecus, of which we have only a few molars and a jaw-bone more recently discovered in 1957, the Java Meganthropus, represented by a fragment of jaw-bone with its teeth, the Tanganyika

Meganthropus, consisting only of jaw and facial bones, and the South African Paranthropus, of which several skulls and a biped's pelvis have been excavated. If I seek to relate the snowman to the Gigantopithecus it is obviously for geographical reasons and because most reports of its size agree with Dr Broom's estimate of that of the Chinese giant.

It is high time that the snowman was also recognised by a scientific name and since the palaeontology of giant primates is so slender, I would give it a new name, *Dinanthropoides nivalis*,[1] or "terrible anthropoid of the snows." If one day its teeth are examined and found to be identical with those of the Gigantopithecus, its name will have to be changed, according to the rule of priority, to *Gigantopithecus nivalis*, the present species being no doubt quite distinct from the Pleistocene primate from Kwangsi. The layman may be surprised that one should give an animal a scientific name on the mere evidence of some footprints and a description of a scalp. In fact this procedure is not only universal in palaeontology, but happens fairly often in zoology. The giant panda and the wolf of the Andes were described merely from skins, the *takahe* was first known only from a skeleton, the first description of the pygmy hippopotamus was based on a skull. And the first (mistaken) name given to the okapi was based on shapeless strips of its skin which were taken for those of some kind of zebra. Naturally the name *Dinanthropoides* risks a similar mistake—firmly though I am convinced to the contrary —but zoology cannot go on ignoring an animal which we know far more about than many fossil species.

We have reason to believe that it is a large biped anthropoid ape, from 5 to 8 feet high according to its age, sex or geographic race, which lives in the rocky area at the limit of the plant line on the slopes of the whole Himalayan range. It has plantigrade feet, and the very conspicuous big toe, unlike that of most monkeys, is not opposable to the other toes. It walks with its body leaning slightly forward; its arms are fairly long and reach down to its knees. It has a flat face, a high forehead, and the top of its skull is shaped like the nose of a shell; its prognathism is slight, but its thick jaws have developed considerably in height, hence the disproportionate size of its molars. To this outsize masticatory apparatus are connected very powerful jaw-muscles. On the cranium there is a sagittal crest which is revealed by a thickening of the scalp in the adult male, at least, and the presence of upstanding hair. It is covered with

[1] In the French edition I suggested the generic name of *Dinopithecus*, but as Broom has already used this for a South African fossil baboon in 1936, it cannot be retained.

thick fur, which in the smaller specimens varies from fawn to dark chestnut in different places with foxy-red glints, but the face, chest and the lower legs are much less hairy. In the larger specimens the fur is an even dark brown or almost black. It appears to be omnivorous: roots, bamboo shoots, fruit, insects, lizards, birds, small rodents and occasionally larger prey like yaks are all grist to its mill in such barren country. Its cerebral capacity should be about equal or even greater than man's. But the development of the brain must have been affected by the strange shape of the skull giving rise to mental qualities very different from those in which man excels.

The position of this Dinanthropoid in the system of zoology is still uncertain, as is that of the other giant primates, which to my mind do not form a homogeneous group, but are the separate peaks of the evolution of different families of primates: the Paranthropus is the last stage in the evolution of the Australopitheci into giants, the Meganthropus is a giant Pithecanthropus. Just as the Pithecanthropus may be merely a large biped descended from the gibbons, so the Dinanthropoid may have evolved similarly, but on a parallel branch, from the orang-utan. Gates and Remane consider that the Gigantopithecus is a giant of the Ponginia, the family to which the orang-utan belongs.

Of course it is not until an actual specimen of the snowman is examined that my deductions can be checked and its provisional description completed. The *Daily Mail* expedition, alas, was unable to provide one, although four columns of men carried out pincer movements over a vast area, and Tom Slick had no better luck. The chances of success seem to be seriously compromised for the future. Slick had no sooner announced his intention of returning to the Himalaya in the autumn of 1958 and Punyabayra had also offered to capture a *yeti* when the Government of Nepal announced that it required a fee of 5,000 rupees from anyone wishing to look for the *yeti*. It strictly forbade anyone to kill one except in self-defence. The Nepalese were not allowed to give information to strangers without permission from the Government, which claimed a right in the creature, dead or alive, and even in any photographs that might be taken.

This decree has not discouraged the enterprising. Now, in the spring of 1958, no less than four expeditions, two American, one Scottish and one Russian, are looking for the *yeti*, which has recently become news in Russia.

Marxist diehards have often maintained that the snowman was a pure invention, a pretext to enable Western expeditions to spy on the frontiers

of Nepal and Tibet. But in January 1958 a Soviet scientist, Dr Alexander G. Pronin, announced that he had seen a *galub-yavanna* (or snowman) the previous August in the Baliand-Kiik valley in the Pamirs, thus extending the animal's area of distribution enormously. Dr Pronin, a senior scientist of the Geographic Scientific Institute of Leningrad University, was in the Pamirs leading the hydrological section of the International Geophysical Year joint expedition of the Uzbek Academy of Science and Leningrad University. It was on 10 August that he first saw the snowman outlined against the top of a 1,500-foot cliff.

> At first [he told *Komsomolskaya Pravda*] I thought it was a bear, but, having collected myself, it became clear that this was no bear but a man-like creature. It walked out of its cave for a distance of some 200 yards and then disappeared beyond the edge of the cliff.

He had observed the creature for some five to eight minutes, and three days later he saw it again at the same spot. He described it as "a man-like creature walking on two feet in a slightly stooping manner and wearing no clothes. Its thick-set body was covered with reddish-grey hair, and it had long arms."

Dr Pronin's report was much criticised. Some asked why he had waited so long before publishing his discovery. The meteorologists at Glacier Fedchenko 2, in the area in question, were even more severe. They had never seen any snowmen and said "We do not believe Pronin's statement, and we think that a true scientist would not publish a discovery until it had been verified several times." Nevertheless they intended to go and look for this non-existent beast at the earliest opportunity. Many first-rate Soviet scientists, the late zoologist P. Sushkin, Professor N. Sirotinin of the Ukrainian Academy of Science, Professor S. Obruchev of the U.S.S.R. Academy of Science and the greatest of their zoologists, E. N. Pavlovsky, had, however, all come out on the side of the snowman's existence.

Soon after Dr Pronin's announcement a Chinese ciné-cameraman confirmed that there were snowmen in the Pamirs. In 1954 when he was filming three colleagues on Mount Muztahl-Ata, 20,000 feet up, he saw two of these creatures one morning. They were not very tall and stooped slightly as they followed one another about half a mile ahead of him.

Actually it is not absolutely necessary to examine a living *yeti*—nor to kill a specimen, which would be needlessly cruel—to clear up the

problem once and for all. The lama Chemed Rigdzin Dorje may be right when he says that some monasteries possess mummified snowmen. A study of one of these specimens would settle the question. It might also be possible to get hold of the rest of Khumjung's missing hide. There must be many other relics of the great ape in a part of the world that bristles with temples and is ruled by clerics. Professor David Snellgrove, the expert on Tibet at London University, told the *Daily Mail* team that he understood that at Pangboche monastery there was not only a scalp but also a mummified hand, much larger than a man's.

In May 1957 the Katmandu *Commoner* revealed that a snowman's head has been kept for 25 years in the remote village of Chilunka, 50 miles north-east of the capital. It was preserved to commemorate the bravery of the men who killed the beast. A quarter of a century ago 32 Nepalese soldiers marching towards Kuti, on the frontier of Tibet, were attacked in the middle of the night by a *yeti* which killed 31 of them. The sole survivor gave the alarm and a patrol of 10 men armed to the teeth were sent off to the place. They found the monster there, sleeping off its meal after eating several of its victims. Ten guns were fired at it at once, but a second salvo was needed to polish it off. The leader of the patrol still kept the beast's head as a trophy.

If an informed zoologist could examine a hand, or better still a skull, he would be able to obtain most valuable information. Even so the diehard sceptics would still suspect that these specimens were in a fossil or sub-fossil state. General incredulity will not be overcome until we can see a good photograph or film of a living *yeti*.

The expedition which may one day bring back these trophies will be able to benefit from the lessons of the *Daily Mail* team, who never succeeded in overtaking a *yeti* although their trails abounded. Each time they lost track of the strange ape-man, which could move faster over a terrain to which it was better suited and was no doubt more accustomed to the lack of oxygen at those heights, while its pursuers had to stop for breath more and more often. And, as Izzard remarked, "a party is as conspicuous as a line of black beetles on a white tablecloth." They would probably have done better to follow Gerald Russell's plan. He was a greater expert in catching animals than anyone else in the party, and he thought that rather than keeping on the move, they should have chosen a good strategic position and remained hidden there, if necessary for a week at a time. As it was, Izzard was a sadder and a wiser man for this experience, and concluded that:

The Yeti is more likely to be met in a chance encounter round, say, a rock, than by an organised search. A reconnaissance party of two or three Sahibs needs about 30 Sherpa porters to support it over a period of about three weeks. We found it impossible to introduce such a large body of men into an "empty quarter" of the Himalayas without disturbing all wild life within it.

We shall find the same situation recurring in most of the problems of unknown animals, and it is this that makes them so hard to solve. It is difficult not to be exasperated when all the pieces of evidence run away as soon as the experts arrive on the scene.

Part Three

THE LIVING FOSSILS OF OCEANIA

Forth from the dead dust, rattling bones to bones
Join; shaking convuls'd, the shiv'ring clay breathes,
And all flesh naked stands:

WILLIAM BLAKE, *The Song of Los.*

CHAPTER SEVEN

The Surrealist Dinosaur of New Guinea

> Alice laughed. "There's no use trying," she said: "one *can't* believe impossible things."
>
> LEWIS CARROLL, *Through the Looking-Glass.*

FEW newly married couples can boast of having met a dinosaur on their honeymoons. Mr Charles Miller and his socialite bride decided to spend theirs among the cannibals of New Guinea. Mummified heads and braised babies eaten by expectant mothers were minor attractions of this resort, compared with their encounter with a prehistoric monster from the Mesozoic era. When they and their bodyguard of Javanese head-hunters had climbed up the River Merauke and reached the Sterren mountains, they discovered an unknown tribe, the Kirrirri, between the virgin forest and the snowline. One day Mrs Leona Miller saw a woman in the Kirrirri village breaking a coconut with a strange tool which looked like a rhinoceros-horn or the end of an elephant's tusk. She was intrigued and told her husband, who found that there were quite a few such tools in the village.

> The tusks, if that is what they were, were composed of a substance resembling horn, applied in cone-shaped layers like a nest of conical paper drinking cups, gradually diminishing in size until the top one came to a sharp point. The tusks were about eighteen inches in length and about six inches through at the base. There was a small, cone-shaped hollow in the bottom, but even so they must have weighed about twenty pounds apiece.

When he asked Wroo, one of the village worthies, where these tusks came from, he drew a sort of lizard in the sand. "It had a large neck, a huge bulging, hump-backed body terminating in a long tail. At the end of the tail, Wroo indicated, the horn fitted like a cap." Thinking he had misunderstood, Miller made him draw the picture again. This time the

animal was more carefully depicted: its head was adorned with a broad collar, and large triangular scales bristled on its spine. "Just as shown on reconstructions of dinosaurs in the museum back home," Miller remarks. To show the length of the beast, Wroo made two marks in the dust with his toe 30 feet apart. He stood back and considered the distance he had marked out. Then he added another 10 feet. So, according to him, the animal was about 40 feet long.

Miller's laughter having met only looks of stern reproof, he asked where these monsters lived. Two or three days' journey away, towards the hills in the north-west, they replied by signs. The explorer, who was also a camera-man and hoped for a sensational story, managed to persuade several Kirrirri to lead him to the giant lizard's lair. This was not easy, for the natives were very afraid of these creatures, which they called *row* in imitation of their cry, a cross between a roar and a snake's hiss. The expedition was fixed for the next day.

The first night, after having climbed all day up fairly steep slopes, they reached an immense grassy plateau where they camped with their native guides. At dawn they set off westwards along the edge of this plateau which became steeper and steeper until it was a cliff that fell some 50 feet. When they reached the western end of the plateau, their guides headed north; they seemed nervous and went more carefully. At last they reached their goal and urged the explorers to lie flat in the grass before looking over the edge of the cliff. Miller was surprised to see a vast triangular marsh covering some 40 acres. It was wedged between the plateau that he was on, another similar one opposite, and the side of the mountains, from which a small stream ran down into the marsh. But he soon stopped admiring the view, for suddenly the reeds began to move.

Miller was paralysed with terror at what he saw. When his wife joined him, she saw in her turn and fell to the ground. Miller thought she had fainted, but she was merely so terrified that she clutched at the grass and dared not raise her head. Slowly Miller lifted his camera and aimed it at the beast whose long neck rose among the reeds.

> As if in obedience to my wishes, the colossal remnant of the age of dinosaurs stalked across the swamp. Once its tail lashed out of the grass so far behind its head I thought it must be another beast. For one brief second I saw the horny point. I heard it hiss—Roooow—Roooow—Rooow.

When he started the camera running the *row* seemed to hear it whirring,

for it suddenly stopped, reared up on its hind legs, its small forelegs hanging limp, and shot its snaky neck in our direction. It was a full quarter mile away, it couldn't possibly hear the camera, but I found myself cowering back as if that snapping turtle-shaped beak would lash out and nab me. I gasped with relief when the creature settled back.

Just then Miller was annoyed to realise that the monster was a fairly light yellowish-brown, just the same colour as the reeds through which it was moving. Moreover it was covered with irregular scales, like pieces of armour, as if they had been designed for camouflage. As he was filming in colour, this was most irritating.

Twice more the *row* reared up, giving me a good view of the bony flange around its head and the projecting plates along its backbone. Then with a click my camera ran out just as the *row* slithered behind a growth of dwarf eucalyptus.

What are we to make of this strange tale, more like a passage from Conan Doyle's *Lost World* than an incident in a travel book that pretends to be true?

I must confess that I have quoted it here in such detail merely in order to give a typical example of the sort of evidence that cannot possibly be accepted. I am not saying that "Cannibal" Miller, as he likes to call himself, is an arrant liar, but he offers not the slightest guarantee of his veracity.

There are many reasons for rejecting Mr Miller's story. It is worth stating them here to show what credit can be given to the other accounts I have cited, which have all withstood a no less severe criticism.

What has happened to the horn from the end of the *row*'s tail? Did Mr Miller bring it back (for the Kirrirri were supposed to have several specimens) so that it could be examined by a palaeontologist? Not that I have heard of—and it would have made some noise in the scientific world. Although his book is lavishly illustrated, there is no picture of this hunter's trophy from a vanished age.

What happened to the film that Mr Miller brought back from Papua? His book was published in London in 1950, and in it he more than once describes showing parts of his film to British film magnates. But not a word about what they thought of the dinosaur sequence. And even if the creature merged into the background, since it was a quarter of a mile away, and only looked like a lizard of indeterminate size moving through grass, the scene would have been worth showing. Any zoologist would have been able to draw valuable conclusions from enlargements of the film.

52. Diplodocus.

53. Triceratops.

54. Stegosaurus.

Supposing the film had been completely spoilt and Mr Miller failed to bring back a horny point of a *row*'s tail, we should have to rely entirely on his word (his wife, in science as in law, can testify neither for nor against him), and many of the accounts in this book are unsupported by any physical evidence. But one can still make the following criticisms of his story.

This is, as far as I know, the only report we have of a *row*, or of anything like it, in New Guinea. Likewise it is the only report of the existence of the Kirrirri, from whom one might be able to obtain further evidence of the creature and its habitat. For nothing but a sheaf of similar reports can establish the veracity of such a story. This rule may

55. Drawing of the New Guinea *row* based on Charles Miller's description.

be waived for a reputable zoologist or naturalist, but not for Mr Miller, who has no scientific standing. Instead of pursuing his studies as an engineer, he became a professional racing driver of cars, motor-cycles and hydroplanes. During the 1914–18 war he became an airman, and, having learnt to fly, he afterwards turned to stunt flying for a circus. Nor does the fact that he was also a wholesale pastry-cook's roundsman help to complete his scientific education.

This need not discredit his evidence: I shall cite many other reports from witnesses much less educated, for very often a detail noticed by a layman may be particularly significant when no one but a few specialists know or guess of its existence.

There are no such details in Mr Miller's account. On the contrary,

his *row* does not even resemble "the reconstructions of dinosaurs in the museums back home." It is an odd jumble of features from well-known but very different animals. It has the long neck and interminable tail of the huge Sauropoda (Brontosaurus and the other Diplodoci), the head (without the horns) and the bony collar of Triceratops, and the body, with its crest of triangular scales along the spine, of Stegosaurus (except that this creature has a double row of scales). None of these creatures has a horn on the end of its tail, though Stegosaurus has a double row of them along the tail continuing the crest along its spine.

It is not a dinosaur. The *row* looks more as if some surrealists had produced what they called an "exquisite corpse," by playing their own highbrow version of "heads, bodies and legs" with extinct animals. It would be rash to assert that such an animal is impossible—zoology and palaeontology are full of surprises—but the dinosaurs from which the *row* has collected its features belong to two distinct and very different groups: the Sauripelvians as far as the long neck and tail are concerned, all the other details come from the Avipelvians. Moreover the Stegosaurians are known only in the Cretaceous period in North America, and it would be rather surprising to find that they had reached the south-eastern tip of Asia, which seems never to have been joined to the North American Continent. It is also most unlikely that New Guinea was ever invaded by large Sauropoda with long necks and tails.

Indeed, until there is proof to the contrary, the *row* looks damnably like an ill-digested memory of a bad Science Fiction film made by a producer ignorant of zoogeography.

No doubt, you may argue, New Guinea is so little explored that *anything* is possible there. In fact it is just because this island, as big as France and Italy together, is so little known that one must be particularly cautious of accepting any unproved reports about it. For in this paradise of head-hunters and cannibals there is hardly any chance of other witnesses confirming a report made by a lone explorer. And so it will remain until there are more expeditions to Papua and the settlers establish peaceful relations with the natives in the very heart of the largest of tropical islands.

CHAPTER EIGHT

The Incredible Australian Bunyips

> I shall laugh myself to death at this puppy-headed monster.
>
> SHAKESPEARE, *The Tempest.*

LONG before the white man set foot in the Australian continent and before the present race of black men was born, the country was inhabited by two kinds of beings. The first were half-men, half-animals, the spirits of the wind, thunder, lightning and all the other natural phenomena; the second were all the totemic animals from which man was descended. So runs the Aborigines' myth; and according to the Australian blackfellows, some of these legendary creatures still exist.

There are a whole series of huge snakes, such as the *wollunqua*, the totem-snake of central Australia, and the rainbow snake, called *mindi* on the lower Murray River. The rainbow snake has a large head, and when it hisses its tongue is seen to have three points. When it slides over the top of a tree, hanging on to the branches with its prehensile tail, it looks just like a rainbow. But this sight is hardly to be recommended, for to see the *mindi* is death. Fortunately the monster gives off a disgusting smell, and so warns one of its approach. It also leaves outbreaks of smallpox in its path.

The legendary *mindi* is no doubt based on a distorted picture of the diamond python, found only in the coastal region. It measures up to 15 feet long; its body is covered with spots in almost all the colours of the rainbow—which phenomenon, by the way, must be extremely rare in a continent where the rainfall is less than 20 inches a year except in a coastal strip in the north-east. The aborigines who mostly live in the dry interior could never have seen a diamond python or a rainbow themselves. One can see how imaginary versions based on hearsay or distorted by tradition could combine the two into a fantastic creature. Moreover, in minds dominated by sympathetic magic, whereby the

BORNEO
CELEBES
MOLUCCAS
NEW GUINEA
Banda Sea
JAVA
Bali
Lombok
Flores
Rita
Pantar
Sumbawa
Komodo
Timor
Timor Sea
NEW GUINEA
Darwin
Arnhem Land
Gulf of Carpentaria
Cape York Peninsula
Coen
Great Barrier Reef
Cairns
Trinity Bay
Normanton
Tully
Rockingham Bay
Cardwell
Atherton Tableland
Dalrymple
NORTHERN TERRITORY
Great Sandy Desert
Alice Springs
QUEENSLAND
Yamba
Australian Cordillera
Fraser I.
Tiaro
Brisbane
Dalby
St.George
Mundubbera
Salt Lake
WESTERN AUSTRALIA
Shark B.
SOUTH AUSTRALIA
L.Eyre
Great Victoria Desert
Callabonna
Darling R.
Nullarbor Plain
NEW SOUTH WALES
Gloucester
Wellington
Newcastle
Orange
Bathurst
Leeton
Narrandera
Murrumbidgee
Harden
Sydney
Jamberoo
L.Alexandrina
Riverina
George
Goulburn
Shoalhaven R.
Conargo
Wagga Wagga
Maroura
Chiltern
Euroa
Mansfield
Lockwood
Tantanoola
Eumeralla R.
L.Burrumbeet
Port Fairy
L.Corangamite
Colac
Ballarat
Melbourne
Geelong
Port Phillip
Bass Strait
Perth
Swan R.
Crystal Brook
Murray R.
Adelaide
Kangaroo I.
AUSTRALIA
Bass Strait
TASMANIA
Great Lake
L.Tiberias
Hobart
0 200 400 600 Miles
Tropical Forests
Desert Regions

character of any object may be transmitted to any other that it touches, the similarity between a snake's scales and the scabs of smallpox would naturally imply a connection between the two.

Much more mysterious is the legend of the *yero*, an enormous water-snake or eel which lives in certain lakes in the north-east. Its head is large, like the *mindi*'s, but it is also covered with red hair. Its throat must be enormous, since the natives believe that it is the source of rapids and are naturally very afraid of it. "On the Atherton Tableland, in Queensland," writes Gilbert Whitley, Curator of Fishes at the Australian Museum, "an aboriginal would never take one across the centre of a lake in his boat because of some mythical animal which lived in its depths."

Is the *yero* really mythical? It would be very rash to assert that it was a complete invention. Perhaps it is just a personification of some other natural danger such as a treacherous reef. Primitive people do not write novels.

56. Reconstruction of Struthiomimus, the ostrich-lizard.

The most puzzling of all are the rumours about the *gauarge*. This strange, half-aquatic animal is supposed to drag into a whirlpool anyone who bathes in its water-hole. It looks like an emu, but without any feathers.

Now if one of these Australian ostriches be mentally plucked, as it were, the result is extraordinarily like one of the dinosaurs of the Mesozoic era: Struthiomimus, whose name means "mock-ostrich."

The dinosaurs were not all enormous. The smallest was not much bigger than a domestic fowl; the Gigantosaurians were 70 to 130 feet long. There were two very distinct orders of dinosaurs, differentiated by the shape of the pelvis: the Sauripelvians, those with a lizard's pelvis; and the Avipelvians, those with a bird's pelvis. The Ornithopods, one of the many kinds in the latter order, were strange bipeds,

mostly vegetarian, which looked very like a running bird, but with more of a lizard's tail. The Iguanadon, 12 to 15 feet high, was one of the largest, but some carnivorous species, like Podokesaurus and Compsognathus, were tiny. They ran about in the grass like featherless hens, except that they were armed with teeth and their rump extended into a long, fleshy tail. Between these pygmies and Iguanodon there were forms like Struthiomimus which lived in the shallows near the shore, but could if necessary take to the water entirely. It was in fact exactly like the *gauarge* in appearance, size and habits.

It would be rash to conclude that the aborigines knew or had handed down a tradition of some belated Ornithopod. But the comparison between the two animals must be made; and the problem of the *gauarge* deserves to be pursued, not dismissed. There is more chance of finding something if you know where to look.

It is much easier to interpret the old Australian legend of *thaballa*, the little laughing boy, who never dies. Many zoologists have long since identified him with the bird (*Dacelo gigas*) known as the laughing jackass. Its cry can easily be mistaken for a human laugh, and heard in some lonely corners of Australia, this hysterical, irrepressible laughter could easily play upon one's nerves.

The most terrifying of these nightmarish creatures of legend is certainly the *yara-ma-yha-who*: the little toothless frog-like man. It lives in fig-trees and has suckers on its hands. It is said to fall upon children playing under the trees, clasp them with its suckers and drain them of their substance.

I am surprised that no zoologist seems to have identified this creature, for, apart from its vampire's habits and savage attacks, it should be immediately recognisable to any expert as the spectral tarsier (*Tarsius spectrum*) the strangest of all the primates.[1] It is a little furry creature with a flat round face and enormous round eyes. It lives in trees, where it sometimes stands up on its hind-legs when it is threatened. Its outline, and some features of its anatomy, are so like man's that Professor Wood Jones, the British anatomist, and his Dutch colleague A. W. Hubrecht have gone so far as to consider it as the closest living species to man. This view is hard to maintain, for many of its features are far too specialised, yet, although it stands only 5 to 8 inches high, it does

[1] There are three distinct species of tarsier: *T. spectrum* of the Celebes is the type of the genus, but there is also a Philippine form (*T. syrichta*) and a Borneo–Sumatran form (*T. bancarus*).

look very like a little man. Besides its monstrous eyes for seeing at night it has enormously long fingers and toes ending in little pads which act as suckers. The length of its feet, and especially its tarsal bone, led

57. Spectral tarsier standing up when threatening or alarmed.

Buffon to give it the name of tarsier, and their structure means that it has to stand on its toes (it is the only primate that is not more or less plantigrade) and is admirably suited to moving by leaps and bounds, like a furry and far more agile frog. Although it weighs hardly 5 ounces, it can manage a long jump of 2 yards or a high jump of 2 feet. And

though it is far from toothless, it seems to be so when it shuts its mouth in a V-shaped and rather devilish little smile.

Does not this description agree with the *yara-ma-yha-who* in everything except the demon's savagery? And even this, though much exaggerated, is not without foundation, for the tarsier is the only primate which is almost entirely carnivorous. True, it eats fruit occasionally, but its chief diet consists of insects, lizards, birds and perhaps even small mammals. It may seem a charming and delightful creature to us, but for its size it is a bloodthirsty beast of prey. Being nocturnal, and thus rarely seen, it naturally arouses weird superstitions in all the countries where it lives. In the Philippines there are tales of "wood-demons," mysterious little ape-men who glide like ghosts through the forests, and, though many of them may refer to the pygmy Aetas who live in the mountains, the tarsiers have some of the devilish marks of these creatures. Only one white man is supposed to have seen a "wood-demon." After the American troops conquered the islands in 1898, guerilla fighting with Filipino partisans went on into the beginning of the present century. One day an American soldier got lost on a patrol in the jungle; he wandered for hours and hours until he was utterly exhausted and lay on the ground and slept. He awoke into a nightmare. A wood-demon was standing before him. Then it suddenly vanished as if by magic. This, at least, was what they deduced from his incoherent babble when they found him several days later, haggard and raving mad. One phrase kept recurring in his delirium:

"Its eyes, its terrible eyes!"

The tarsier certainly has more striking eyes than any other creature on earth, and in the dark its enormous eyeballs shine with a bright yellow light. It is easy to imagine the soldier waking among strange and sinister noises to see one of these grinning little gnomes, that had come, full of curiosity like the other primates, to have a look at the sleeping man. Perhaps it even jumped on his throat. Dazed and bleary-eyed and perhaps suffering from jungle fever, which oddly distorts one's sense of distance, he must have thought he was looking at a demon from Hell, a demon that could vanish in a single bound.

Most people are bewildered, if not alarmed, the first time they see a tarsier, for it really does look like a sprite. It is not surprising that the naturalists called it "spectral" and that many people still believe it is a real ghost. The only reason why it has not been identified with the *yara-ma-yha-who* is that it is found only in the Malay archipelago: in Sumatra, Borneo, the Celebes and some of the Philippines—never in Australia.

Tarsioids, of which the tarsier is the only remaining survivor, were once very widespread. In the Eocene period at the beginning of the Tertiary era these strange mannikins were found in the whole of North America and in Europe. But, apart from species imported by man—the dingo and the rats—and several bats which could have flown across the sea, there are no wild mammals in Australia with placentas.

125 million years ago, in the middle of the Cretaceous period, the marsupial mammals ruled the earth and were found over most of it. Presumably Australia was then connected to the other continents and accessible to land animals. At the very end of the Mesozoic era or at the beginning of the Tertiary, Australia and New Guinea, still joined, were cut off from the rest of the world. When the placentary mammals overran the earth in their turn they had to stop short at the Wallace Line, that invisible zoological frontier which runs between Bali and Lombok and between Borneo and the Celebes. They could not reach New Guinea or Australia, where the marsupials were able to develop in peace until the arrival of man.[1]

Thus it is unlikely, if not impossible, that there have ever been tarsiers in Australia. Small mammals might be carried across a narrow strait of sea on a floating tree-trunk, and the tarsiers have in fact crossed the Wallace Line and are found east of it in the Celebes. But that they should have stowed away and made the perilous voyage, drifting across the Timor Sea or through the Moluccas and the Banda Sea, is too fantastic. They did not have a Kon-Tiki raft.

If there can never have been tarsiers in Australia, the legend of the *yara-ma-yha-who* may throw some glimmer of light on the history of the Australian people. John Mathew has suggested that men of Malay race have infiltrated northern Australia at a relatively recent date. This theory has been rejected, for it is in the north that the Aborigines are particularly black and fuzzy-haired, and an invasion of Malays with fair skin and straight hair would have diluted these features. But is it likely that legends about tarsiers should have been handed down since the Pre-Dravidian tribes came to Australia from the Celebes, Borneo or Sumatra, an event usually put in the middle Pleistocene, at least 50,000 years ago? Most authors maintain that this invasion took place in a

[1] In America there are now only two families of marsupials, the Didelphidae, the American opossums, and the very rare Caenolestidae. Doubtless the former have survived because they are small, can hibernate, and are extraordinarily prolific. The opossum has two litters a year, each averaging 9 young. It may have as many as 21, but there are no more than 13 teats, so the youngest born cannot survive.

series of waves as the Aborigines were driven out by the Malays. The legend of the *yara-ma-yha-who* is a small scrap of evidence that the last of these waves, whether of Malays or Pre-Dravidians, did not arrive long before the discovery of Australia by white men.

These creatures of aboriginal legend may seem strange, but it was when Europeans began to meet the animals of Australia that the really fantastic stories started circulating. Almost all of them proved to be well-founded. So we should be less sceptical about those which are still unexplained.

When, at the beginning of the seventeenth century, the brave seamen sent out by the Dutch East India Company set about exploring the eastern seas for spice islands, they several times set foot on what seemed to be a very vast new land, which they loyally named New Holland. There they said there lived an animal as large as a man, with head like a deer and a long tail. It stood on its hind-legs like a bird and could hop like a frog. In 1640 Captain Pelsart gave an accurate description of it, only to be greeted with derision at the tall stories told by seamen. In 1770 Captain James Cook landed in Trinity Bay to repair the *Endeavour*, which had been damaged on the Great Barrier Reef. On 9 July Sir Joseph Banks, the famous naturalist and patron of the sciences, went off with one companion to look for game to replenish their rations. In Cook's words:

> Going in pursuit of game, we saw four animals, two of which were chased by Mr. Banks's greyhound, but they greatly outstripped him in speed, by leaping over the long thick grass, which incommoded the dog in running. It was observed of the animals that they bounded forward on two legs instead of running on four.

Later Cook learnt that this sort of giant jerboa was called *kangaroo*.[1] His evidence had to be believed. But the world was in no hurry to do so. It was twenty years before Dr George Shaw gave the kangaroo its Latin name. Cook had overlooked its strangest feature: the pouch on the female's belly in which she carries her young. Marsupial pouches were not new to zoologists. It had long been known that the opossum had a

[1] It is often said that this word does not refer to the animal in question but merely represents the puzzled natives' reply to the English explorers' questions. Some say that it means "I don't understand"; others that it is a garbled repetition of the beginning of the question, "Can you tell me. . . . ?" These stories are a complete fabrication. In 1901, Dr W. E. Roth, in charge of native affairs in Queensland, confirmed that the animal had always been called *ganguru* around Cookstown; and Cook included the name in his vocabulary of the Koko-Yimidir tribe.

similar pouch (though, as it was a quadruped, the opening was at the back, whereas the biped kangaroo's opened at the front, or top). But they were so convinced that it was peculiar to the opossum that when Seba described an "eastern philander" or cuscus, a pouched animal that had been sent him from Amboina, Buffon thought that there had been a mistake.

Soon it was found that *all* the indigenous Australian mammals had pouches. What was the rarest exception elsewhere was the rule here. More surprises were to follow. In 1797 a settler in New South Wales found an animal which he called an "aquatic mole." Actually it was more like an otter, but it had a duck's webbed feet and, what was even more extraordinary, a duck's beak. When the first skin arrived in London and was examined by the Zoological Society it was almost unanimously thought to be a fake, like the confected mummies that travellers brought back from China. Nevertheless Dr George Shaw examined the skin minutely and found no trace of glue or stitches. He announced that the skin was genuine and in 1799 published the first scientific description calling it *Platypus anatinus*, or "the flat-footed animal with a duck's beak." The skin was sent to the German zoologist, Blumenbach, then considered the greatest authority on classification. He described the animal in 1801 and gave it the name *Ornithorhynchus paradoxus* "the paradoxical animal with a bird's beak." The name *Platypus* had to be discarded, having been used in 1793 for a small beetle, and *Ornithorhynchus* it has remained to this day.

It was one thing to give the strange animal a name, it was quite another to classify it in the system of zoology. As it was covered with hair, Shaw had no doubt that it was a mammal. But in which order did it belong? Blumenbach put it in the Edentates, that rag-bag of unclassifiable mammals. Then in 1802 two more specimens, this time preserved in alcohol, arrived in England. One of them was a female, and the zoologists were astounded to find that this presumed mammal (or "animal with teats") hadn't any teats at all! Moreover neither of them had a separate anus and genital duct like the rest of the mammals, but a single cloaca like the reptiles and birds. Yet they could not belong to either of these classes since they were covered with fur, not scales or feathers. The anatomist Everard Home therefore proposed to create a separate order to include this duck-billed animal with another creature with a cloaca which had been discovered in Australia in the meantime: the echidna, a sort of porcupine whose long snout also looked like a beak. This was done a year later when Étienne Geoffroy-Saint-Hilaire created the new

order of monotremes or "animals with a single hole." But he prudently refrained from stating which class this order belonged to. Lamarck more boldly wanted to create a completely new class, the Prototherians or "first mammals." For one could hardly include an animal without teats among the true mammals, and a creature covered with fur could not be a reptile.

Then news arrived from Australia that the platypus laid eggs, or so Sir John Jamison wrote on 17 March 1817. This brought it even closer to the birds and reptiles; it certainly could not be a true mammal. But in 1824 the German scientist Meckel, examining the animal more carefully, found that it had mammary glands. They had not been noticed before because they were very small except in the breeding season.

Impossible! argued Etienne Geoffroy-Saint-Hilaire and his son Isidore, supported by Blumenbach. If the Monotremes lay eggs—and they do lay eggs—they cannot have mammary glands. The glandular formations must be musk-glands.

No, replied Meckel, they are true mammary glands. The monotremes are true mammals and they are therefore certainly viviparous. The legend that the platypus lays eggs is absurd.

And such eminent scientists as Cuvier, Oken and Blainville agreed with him. There were others, like Richard Owen and Home, who subtly sat on the fence and averred that perhaps they had mammary glands and perhaps they did not, but as they seemed to belong both to the viviparous mammals and the generally oviparous reptiles, they must be ovo-viviparous—that is to say, they formed eggs which hatched inside the body and so the young were born alive.

In 1829 Robert B. Grant claimed he had found four platypus eggs and sent a very careful drawing of them to Europe. The triumph of the Saint-Hilaire clan was short-lived when experts identified the eggs as those of an Australian long-necked tortoise (*Chelodina longicollis*).

In 1832 Meckel, Cuvier and Co.'s victory seemed complete when an Australian naturalist, Lieutenant Maule, established without a shadow of a doubt that the glands on the platypus's belly actually produced milk. There was a small fly in the ointment, however: Maule had found eggshells in the platypus's burrow. But these eggs could have—indeed they *must* have—come from some other animal.

Some thirty years later, on 21 September 1864, Dr Nicholson sent a letter to Professor Owen in which he told how a platypus that a workman had caught and put in a gin-crate laid two eggs during its first night in captivity. The Professor was not convinced. He had stated once and

for all that the monotremes were ovo-viviparous. The platypus must have had a miscarriage from fright.

It was not for another twenty years that the matter was settled. The reproduction of the monotremes had been disputed for almost a century when on the same day in 1884 two naturalists—Dr W. H. Caldwell, who

58. Platypus suckling its young (after Hartwig, 1910).

was working on the platypus, and the German Professor Wilhelm Haacke, who was studying the echidna—simultaneously announced that they had proved that the monotremes were oviparous.[1]

Everybody had been wrong.

I have related the platypus's history at such length in order to show that an animal which all the scientists think impossible may actually exist. The *bunyip* is not half so impossible as the platypus.

What is a *bunyip*? Not an easy question to answer. Nowadays the Australians use it to mean a "bogey," something at once frightening, shadowy, imaginary and rather ludicrous. But to some men it is a flesh-and-blood animal with a clearly-defined appearance and habits. Originally it was a native word meaning "devil," "angel" or perhaps even "god"; for the totemistic religion of the Australian aborigines is so different from our own that exact translation is impossible. It might, I believe, derive from the word *bunyil* (or *pundjel*) which the Victorian aborigines use to signify their Supreme Being. At all events it

[1] It was later discovered that the monotremes were even stranger than had been thought. They are the only mammals in the world to have not only poison glands but an inoculatory apparatus in the form of a spur which is found only in the male. Moreover their body temperature is only 82° F., much lower than the other mammals.

is constantly used to refer to the author of anything inexplicable, and hence white settlers came to use it for any mysterious beast. The strange thing is that so many accounts of *bunyips* should agree in so many particulars.

The first report that Gilbert Whitley of the Australian Museum includes in his dossier of the *bunyip* comes from the French explorers in the crew of the *Géographe*. In June 1801 Charles Bailly and his companions made their way into the interior, having named a bay on the southern tip of the west coast after their vessel. Suddenly they heard a terrible roar, louder than a bull's bellow, which seemed to come from the reeds in the Swan River. They were terrified and took to their heels, convinced that it was some great water-beast. Later the explorer Hamilton Hume confirmed the existence of some such monster, but at the other end of the continent. He said that in Lake Bathurst he had seen an animal, which from his description must have been some sort of manatee or hippopotamus. Five scientists of the Philosophical Society of Australasia at once promised to pay all his expenses if he managed to procure a skull, a skin or a skeleton of his unknown animal. Hume never found one, but he had not invented the story, for many similar tales at once began to come in from various places in Australia, especially in the south-east. Thus Lieutenant W. H. Breton wrote of Lake George, "It is pretended that a species of seal, or, as it was called, a devil, has been seen in it."

By the middle of the nineteenth century the legend of the *bunyip* was well established. Everyone began to be interested in the beast, which was soon saddled with anything mysterious that happened. In 1846 a fragment of a skull was found on the banks of the Murrumbidgee, a tributary of the Murray River. It was sent to the naturalist W. S. Macleay as the skull of a "true *bunyip*." He identified it as the deformed skull of a colt. But when Professor Richard Owen saw a drawing of it in London he immediately decided that it was a calf's. One of the experts must be wrong. So the problem was not so puerile as they seemed to imply. Quite possibly they were both wrong. We shall never know; the specimen was deposited in the Australian Museum, but, as one might expect of a *bunyip*, it has mysteriously disappeared.

In 1847 Governor Latrobe managed to get hold of copies of native drawings of two kinds of *bunyips* from Victoria. He sent them to Tasmania, but, alas, they too seem to have vanished.

In 1848 one turned up in the Eumeralla River near Port Fairy in Victoria. Those who had seen it said that it was a large brown animal

with a head like a kangaroo. It had a long neck with a hairy mane, and its mouth was enormous. When questioned about it, the natives said that it had the strange power of drawing its victims irresistibly towards it across the water.

In 1872 a strange and possibly similar animal was said to have been seen in Lake Corangamite, Victoria. It came so close to a boat that the terrified people on board dashed to the opposite gunwale and capsized the vessel. It was said to be an "animal like a big retriever dog, with a round head and hardly any ears." Many people had also seen one in Lake Burrumbeet near Ballarat.

The *wee-waa* which was seen more than once at this time and then again a year later in a lagoon near Narrandera was also compared to a retriever by those who saw it; but it was only half the size, and its body was covered with long black hair, shining and as black as jet. It can hardly have been a very fearsome apparition. In 1873, also, a creature with a seal's head was supposed to have been seen rising out of the water near Dalby in Queensland. It had a double but asymmetrical caudal fin. In 1876 a hairy animal of unusual appearance turned up in Crystal Brook in South Australia. A price was put on its head, but to no effect. And reports went on coming in—from the Malmsbury reservoir, Wagga Wagga, and many other places in Victoria and New South Wales —and becoming more detailed. Most of them sounded like distorted descriptions of a seal or a dugong.

But not all were as sober as those I have just quoted. The Rev. George Toplin described the *moolgewanke*, or *bunyip* of Lake Alexandrina, as a weird creature, half-man, half-fish, with hair like a sort of wig of reeds. Unlike the sweet-voiced mermaids, this merman had a voice like the rumble of a distant cannon; and unlike them it did not lure you to destruction—it merely gave you rheumatism.

The *tunatpan* of the Port Phillip area was even more picturesque and recalled the Eumeralla *bunyip*.

> It was as big as a bullock, with an emu's head and neck, a horse's mane and tail, and seal's flippers, which laid turtle's eggs in a platypus' nest, and ate blackfellows when it was tired of a crayfish diet.

In 1886, horsemen fording the River Molonglo saw a creature, "whitish in colour and about the size of a large dog. Its face was like the face of a child." All the same they had no qualms about throwing stones at it and driving it away. The *bunyip* of the Tuckerbil swamp near Leeton which was reported until the summer of 1929–30 takes one into the realm of the marvellous. It was described as "a two-

headed Bunyip which could swim both ways without changing gear." It was hardly surprising that it escaped its pursuers! But other reports must have had more of a ring of truth, for in 1890 a team from the Melbourne Zoo made a systematic attempt to capture a *bunyip*-like monster in the Euroa district in Victoria.

Similar water-monsters have several times been reported in Tasmanian lakes, outside the Australian continent. In the autumn of 1852 one of these big devils was seen in Lake Tiberias. It was between 4 feet and 4 feet 6 inches long, had a bulldog's head, and was covered with shaggy black hair. It was seen at first in shallow water, giving a glimpse of its crooked feet, but quickly disappeared into deeper water. No doubt they were similar animals which were often seen in the Great Lake. The length was always between 3 and 4 feet and the head was round like a bulldog's. Often they splashed water 6 to 10 feet into the air. Between 1860 and 1870 there was no lack of reports about them in the same terms. In 1863 someone was able to observe one for some time and described it as a sort of sheepdog with two little fins, like small wings. It moved at the considerable speed of about 30 miles per hour. The dam at Waddamana and all the vicissitudes which the Great Lake suffered for the Tasmanian hydro-electric schemes did not drive the *bunyips* away, for they reappeared several times in 1932.

"Apart from the most extravagant fabrications," Whitley concludes after reviewing the most consistent rumours, "we must be struck with the comparative uniformity of bunyip description over a long period." Generally it is a large furry animal, the size of a dog and with a dog's head, but with very small or even invisible ears. It swims with fins and lives in rivers, marshes and inland lakes.

This description reminds one irresistibly of a seal or a sea-lion; and there are several genera of these animals in Australia and Tasmania: seals (*Hydrurga*, *Lobodon* and *Leptonychotes*), sea-lions (*Arctocephalus* and *Zalophus*) and even the great sea-elephant (*Mirounga*). But could these sea animals reach inland waters? There is no reason why they should not, for a species of seal exists which is never found in the sea: the *Calocephalus* that lives in the lakes and inland seas of Asia, the Caspian, the Aral Sea, Lake Baikal and Lake Oron. Moreover in Australia seals and sea-lions are said sometimes to reach the drainage basin of the Murray River and its tributary, the Darling. Dr Charles Fenner mentions a seal killed at Conargo, on the Murrumbidgee in New South Wales, 900 miles from the river's mouth. A maned sea-lion was also captured at the junction of the Kangaroo and Shoalhaven Rivers. A

sea-leopard was killed in the latter river in 1870. When it was cut open an adult platypus was found in its stomach. As Whitley remarked, "Surely a bunyip within a bunyip!"

Thus it seems well established that seals can travel long distances in fresh water, and it is possible that they may go a short way over dry land. Most of the reports about "water-devils" come from the south-east of Australia, that is to say from the drainage basins of the only two large rivers on that continent.

The sight of a seal or a sea-lion far inland would be very unusual, and it is therefore hardly surprising that these strange animals should be described as *bunyips*. It is worth recalling that when the Aborigines' tales of specially formidable *bunyips* were investigated they turned out to be merely Indian cattle (genus *Bibos*), which white settlers had imported, and which had occasionally escaped and returned to a state of nature. The sight of these huge and utterly unknown horned beasts terrified the blackfellows. They were quite unlike any indigenous animal and thus well deserved to be called *bunyips*. Their bellowings may account for some of the terrifying roars attributed to *bunyips*, but not that heard by Bailly and his companions before these cattle had been introduced into Western Australia. Whitley suggests that these dreadful cries could have been made by seals or sea-elephants. Even if they were a long way off their calls would have a terrifying effect in the lonely western deserts. ". . . in some parts in Western Australia," he observes, "I have known silence so utter that it was quite oppressive, and that the sound of my solitary footsteps seemed, by contrast, to be a crunching roar."

The dreadful cries attributed to the *bunyip* in the south-east are more likely to come from a much smaller but equally loud creature, the brown bittern (*Botaurus poiciloptilus*), a bird whose booming voice has earned it the name of "Murray Bull."

It is, however, by no means certain that the legend of the water-*bunyip* is based on stray seals and sea-lions. Many reports come from places that these animals could not reach. Australian scientists have therefore put forward much bolder theories to explain it.

> The Bunyip [writes Whitley] has been thought to have been an extinct marsupial otter-like animal, rumours of whose existence have been handed down in aboriginal legends, the latter corrupted and confused with crocodiles in the north of Australia and seals in the south.

Why "extinct"? The reports that have cropped up over a century and a half speak of a living animal, not a ghost. There are marsupial

equivalents of most types of placentary mammals: running, jumping, climbing, tree-dwelling, gliding and burrowing types. "Nevertheless," as Jean Piveteau has remarked, "certain types of adaptation are missing; there are none truly aerial or truly aquatic." Might not the *bunyip* be an example of the missing aquatic type? In any case the insistence of some zoologists that legends of unknown animals are based on extinct species seems to be an *idée fixe*. Thus Dr Anderson, Director of the Australian Museum, writes, "There may be aboriginal legends of the former existence of the *Diprotodon*, which is commonly believed to have haunted rivers, swamps and inland lakes." But that is another story.

When Mary Ellen Chase wrote *Harvey*, a play about a drunk whose best friend is a rabbit 10 feet high that no one else can see, she must have chosen this eponymous and invisible animal for its very improbability. Yet there are plenty of people in Australia who claim to have seen creatures not unlike Harvey. They were gold-prospectors who had penetrated into the vast sandy western desert and the waste of thorny scrub in the central depression, which together are several times the area of the British Isles. When they returned, exhausted and feverish, from their gold-panning expeditions, they brought back ludicrous tales about rabbits 10 feet long. Naturally there were hints that these monsters, like Harvey himself and the pink elephants so beloved of humorists, were a by-product of alcohol; for gold-mining is not an abstemious trade.

But these stories recurred so insistently that in the end they aroused the interest of some scientists, among them Ambrose Pratt, the great Australian naturalist. He seriously asked whether these Brobdingnagian rabbits might not be surviving specimens of the Diprotodon, a gigantic wombat, as large as a rhinoceros, which once wandered the Nullarbor Plain, before the increasing drought turned most of the continent into a desert. The skulls that have been found of these giants of the marsupial kingdom are as much as 3 feet long. There is no lack of information about their anatomy, for more than a hundred more or less complete skeletons were discovered in the Salt Lake at Callabonna.

This creature's fat body reminds one more of a huge bear than of a rabbit, but the same is not true of its head. Like the kangaroos, it has a face very like a rabbit's or a hare's, with two conspicuously large incisors in the upper jaw under a typical "hare-lip," hence the name of Diprotodon ("with two teeth in front"), a characteristic of the vegetarian marsupials. As, according to several accounts, these harmless great

beasts made off at top speed as soon as they met a man—who did likewise—the mistake is easily understandable. But, whether the Diprotodon looked like a rabbit or not, could it have survived until today?

The climatic upheavals which have transformed the appearance of Australia at a comparatively recent date are usually blamed for the Diprotodon's extinction. This placid vegetarian's habits are supposed to have been like a tapir's; it enjoyed a semi-aquatic habitat among the lush vegetation which still covered the continent at the end of the last Ice Age, between 12,000 and 30,000 years ago, until the ever-increasing drought ate away the country like a leprosy.

No doubt the Diprotodon tried to survive in various oases, and, as they dried up one by one, vast hordes of these brutes must have set off

59. Reconstruction of the Diprotodon.

to wander in search of new water-holes until they perished of thirst in the sandy desert or died in herds most conveniently for the palaeontologists. Thus in June 1953 Professor Ruben A. Stirton of the University of California returned to Adelaide from the dry north-west of South Australia where he had found a Diprotodon graveyard containing between 500 and 1,000 skeletons in a superb state of preservation. A vast herd of these poor beasts, dying of thirst, had apparently ventured on to the hard crust where a lake had recently dried up to no more than a few tempting pools. The crust gave way under their weight and they gradually sank into the soft clay, which preserved their skeletons from the weather. Some of them had their paws folded beneath them, as if they had met their death calmly welcoming the moisture of their muddy grave.

How long can one say for certain that the Diprotodon survived? According to more cautious estimates they must have been known and probably hunted and eaten by the first blackfellows who came to Australia. Among some aboriginal tribes legends are still current which seem to refer fairly exactly to them. Professor John Walter Gregory is firmly convinced that the central Australian aborigines' mythical *kadikamara* is based on knowledge of living Diprotodon. And in 1872 Dr George Bennett, a palaeontologist of the Australian Museum, reported that:

> I have had a long conversation with 'Charlie Pierce', an aboriginal, relative to these fossils; and he avers that they are those of an animal, long extinct, known to the natives by the name *Gyedarra*. Tradition among them has handed down the appearance and habits of the animal for generations, but Charlie says he never paid much attention to the descriptions that have been given to him, but imagines the animal was as large as a heavy draught horse, walked on all fours the same as any other four footed beast, eating grass, never went any distance back from the creeks to feed, and spent most of its time in the water, chiefly in enormous holes excavated in the banks. I told him he must mean some other animal; but he spoke most positively, and asserted that the bones we have been finding are those of the animal he was speaking of, and that at one time the bones were very numerous about the Gowrie water holes, where his forefathers had seen the animals themselves sporting about. I again asked him if they did not live on the leaves of trees, and his reply was that they were never seen to feed on them, but always on grass, the same as a horse or bullock.

Now van Gennep considers that an oral tradition cannot originate more than two or three centuries ago, without being radically distorted and transformed. Thus even the boldest estimates, according to which the Diprotodon still haunted the central plains hardly 2,000 or 3,000 years ago, would seem to be too cautious, and one should take the more heed of prospectors' tales of "giant rabbits." For the drought which certainly decimated the Diprotodon need not have exterminated them entirely, any more than it has the other vegetarians—and the carnivores that feed upon them—that are found in the continent. Moreover, Australia is by no means waterless: there are still lakes, marshes and streams where the Diprotodon might find shelter as other animals do.

All the same, the "giant rabbits" have, according to the prospectors' tales, a habit that has made some zoologists pause before identifying them as surviving Diprotodon. Witnesses have often stressed the extra-

ordinary speed at which the "rabbits" made off—some even thought that they literally vanished into dust. Indeed, these giants may have been likened to rabbits because of their sudden flight as much as their general appearance. Was Ambrose Pratt's identification wrong? For it is hard to imagine a heavy animal like the Diprotodon running like lightning. Are not these "rabbits" more likely to be a gigantic form of kangaroo, which can vanish in one jump? The larger species, like the red kangaroo (*Macropus rufus*) and the grey kangaroo (*Macropus giganteus*), which are almost as high as a man, can jump 30 feet in one bound. And some reports have referred explicitly to "kangaroos 12 feet high."

The discovery of fossil remains of similar giants (*Palaeorchestes*) has given added weight to these rumours, especially as it is well-established that these animals lived recently. Even so, it is not impossible that the rumours are based on encounters with much heavier and no less recent animals like the Diprotodon. "Australians who hunt the water buffaloes that now run wild in huge numbers in the north of their continent will tell you that this great beast can literally vanish before your eyes even in fairly open country," Ivan T. Sanderson remarks—a cloud of dust, and the beast has gone, disappeared, no doubt behind a convenient bush. What is true of these cattle could clearly also apply to the Diprotodon, of comparable size.

Whether it is a Diprotodon or not there is little doubt that an animal of unusual size lives in the deserts of Western Australia, but what it is still remains to be settled. Even the boldest naturalists hesitate to venture into this hostile country, remembering perhaps the tragic fate of Dr Ludwig Leichhardt. He arrived in Australia in 1841 and immediately went right across the whole continent to Fraser Island, covering some 2,500 miles. He tirelessly carried out several other explorations, and his researches gradually led him to the belief that the Diprotodon was not extinct. In 1847 he organised an expedition with the secret hope of bringing one back alive. He set off enthusiastically into the dry heart of the continent and it is known that he reached the River Cogun on 3 April 1848. Nothing more was ever heard of him or his companions. The trail of unknown animals sometimes leads to Hell.

CHAPTER NINE

The Queensland Marsupial Tiger

"You'll see me there," said the Cat, and vanished.
Alice was not much surprised at this, she was
getting so well used to queer things happening.
LEWIS CARROLL, *Alice in Wonderland.*

To the zoologist Australia is indeed an upside-down country. While the animals found there were strange, if not extraordinary—the marsupials, and especially the monotremes, exceeded the scientists' wildest hopes—explorers and settlers constantly but vainly looked for familiar animals, as if to reassure themselves that this bewildering place was somehow normal.

Thus when that famous buccaneer, William Dampier, discovered a bay on the west coast of Australia in August 1699 and named it Shark Bay, he reported that it was inhabited by a quite imaginary hippopotamus. They had caught an 11-foot shark (hence the name of the bay):

> Its Maw was like a Leather Sack, very thick, and so tough that a sharp Knife could scarce cut it: In which we found the Head and Boans of a *Hippopotomus*; the hairy Lips of which were still sound and not putrified, and the Jaw was also firm, out of which we pluckt a great many Teeth, 2 of them 8 Inches long, and as big as a Mans Thumb, small at one end, and a little crooked; the rest not above half so long.

Actually it was merely the head of a dugong, a large herbivorous water-beast that ends in a mermaid-like tail and has a head vaguely like a hippopotamus's; the male has two bevelled tusk-like upper incisors, larger than the rest and also reminiscent of that animal.

Thereafter explorers searched Australian waters for a non-existent animal. It would have been most surprising to find a true hippopotamus in the open sea, even though it is fond of brackish water. Settlers have always been inclined to rediscover familiar animals in their new land and name them after the species they knew at home. So Australia was

soon full of "native" rats and "native" mice—to say nothing of rabbits, squirrels, moles, wolves, foxes, badgers and cats which had only a superficial connection with the real ones.

Crocodiles were also reported in places in Australia where there were none. There are in fact two species of crocodile in Oceania: the double-crested crocodile (*Crocodylus porosus*), a huge monster that may reach a length of 22 feet, and Johnston's crocodile (*C. johnstoni*). The first, the only crocodile to enter the sea, is also found in the Indies and in the Fiji Islands; the second is purely Australian. Both are found only in the north. One would not expect to meet one in New South Wales.

But in November 1939 an engine-driver on the light railway to Angourie beach in the north of that province was astonished to realise

60. Australian dugong.

that a log near which he had stopped his locomotive was actually a 15-foot crocodile. The beast opened its jaws threateningly. The driver hurriedly started his engine and made off at full speed.

When he told his story several people remembered that they too had seen a crocodile in the district. Then others recalled that several years earlier a sick circus crocodile had been brought to Yamba. Did it really die, as was said at the time? Sinister roars were heard at night. This sort of thing could not go on; and politicians, ever anxious for glory, helped the police to comb the district. They even went so far as to dynamite suspicious holes in the ground, bagging a lot of snakes and even a 5-foot goanna lizard which was exhibited for some time in a local hotel. At last, the circus crocodile's remains were exhumed, eliminating it from the suspects once and for all.

Soon crocodile-hunting became a local attraction: even the Christmas holiday-makers joined in. But no one managed to flush more than a host of goannas and four courting couples. The blackfellows began to whisper that a devil hid in the lake, and a sense of fear gradually took the place of the first excitement. People were careful to lock their doors after dark.

Then tracks were discovered that looked as if they had been made by a huge pigeon. Casts were taken and sent to the expert on herpetology at the Australian Museum in Sydney. He recognised that, both in size and shape, they agreed with a crocodile's footprints. But as nothing more was heard of the monster in the next few weeks the obsession about it gradually dwindled and died. The roars heard in the district were attributed to bitterns, and crocodile hunting was out of fashion. But the footprints had been real enough—and must have been made by a large reptile.

Was it really a crocodile? May it not have been an unknown species of large lizard? Until quite recently Australia was inhabited by a giant monitor lizard (*Varanus priscus*) beside which the Komodo dragon would have seemed quite small. It was 20 to 25 feet long, whereas I doubt if the Komodo dragon ever reaches 12 feet. Such a monster could easily be mistaken for a crocodile. And it would be much more likely to live near the forests of New South Wales than would a crocodile.

The marsupial tiger is the most important of these apparently familiar animals to be found in Australia. Its existence is no longer in doubt—though it is still not officially recognised—but the first reports were based on misinterpreted rumours.

In November 1642 Captain Abel Janszoon Tasman on board the *Heemskirk* sighted land which he took to be the southern tip of New Holland. He named it Van Diemen's Land in honour of the Dutch governor on whose orders he was seeking a southern sea-route between America and the Orient. It was none of his business to explore new lands, and he did not set foot on the island that was later to bear his name; but he sent his chief pilot, Francoy Jacobszoon, ashore with a handful of men. They came back with some alarming tales. Besides notches in trees which they thought had been made by giants they had seen footprints with claws like a tiger's.

There is no doubt that these had been made by a Tasmanian or pouched wolf (*Thylacinus cynocephalus*), a sort of marsupial wolf, which, by an odd chance, is striped like a tiger on the middle of the back, rump,

thighs and tail. It has five toes on its fore-feet, the footprints of which cannot therefore be confused with a dog's or cat's. It has only four toes on its hind-feet like a dog or cat, but whereas they walk on their fingers, it puts the whole sole of the foot on the ground, and so leaves a relatively larger footprint. Hence the confusion with tigers.

Nevertheless Dutch explorers confirmed the presence of a tiger in Australia half a century later. The administrators of the Dutch East India Company at Batavia used to make reports on information collected from pioneers' log-books. Thus in an anonymous report dated 1705 and quoted in Major's *Terra Australis*, "snipe, a tiger and a large number of black birds" are said to have been found in Australia. The birds are

61. Thylacine or Tasmanian pouched wolf.

no doubt black swans or black emus—now vanished—but the tiger is much more of a puzzle. Was it also a thylacine? One would hardly think so, for this creature is much more like a dog—its Latin name means "the pouched dog with the wolf's head"—were it not that settlers persisted in calling it a "marsupial tiger." Furthermore, although fossilised remains have been found on the Australian mainland, it has long been confined to Tasmania.[1]

What then is the origin of the tales of tigers—and even lions—that have been current all over Australia since it was first colonised. There is

[1] It may even have disappeared in Tasmania during the last few years. The most recent scientific expeditions have found no traces of it. But early in 1957 an airman took a photograph from a helicopter of a striped beast on the deserted beach at Birthday in the west of the island. It was probably a thylacine. An expedition was at once mounted in order to capture a specimen, which would be released again after it had been studied.

nothing vague about them as one can see from R. W. Mackay's résumé in the *Sydney Morning Herald* of 9 December 1939:

> There are records from Pipers Creek, Mansfield, Lockwood, Chiltern, Briagolong, and other places in Victoria; from Harden, Tantawonglo, Goulburn, Gloucester, Wellington, Jamberoo, Orange and other places in New South Wales; from the Three-Mile Scrub, Brisbane, the St. George district, and Normanton in Queensland.

All these places are on the eastern coastal strip among the wooded mountains of the Australian Cordillera and its continuation, the Australian Alps. But the most relevant rumours seemed to be confined to the York Peninsula, at the extreme north of the mountain range.

62. Drawing of the Queensland marsupial tiger-cat based on all the evidence about it.

In 1871 the first detailed report about an unknown cat in Queensland was published in the *Proceedings of the Zoological Society*. It consisted of a letter written on 2 August of that year to the famous zoologist Sclater by Brinsley G. Sheridan, a Police Magistrate at Cardwell:

> One evening strolling along a path close to the shore of Rockingham Bay, a small terrier, my son's companion, took a scent up from a piece of scrub near the beach, and followed, barking furiously, towards the coast-range westwards. My boy (thirteen years of age, but an old bushman, who would put half those described in novels to the blush) followed and found in the long grass, about half a mile from the spot the scent was first taken up, an animal described by himself as follows:— "It was lying camped in the long grass and was as big as a native Dog; its face was round like that of a Cat, it had a long tail, and its body was striped from the ribs under the belly with yellow and black. My Dog flew at it, but it could throw him. The animal then ran up a leaning tree, and the Dog barked at it. It then got savage and rushed down the tree at the Dog and then at me. I got frightened and came home."

Sheridan made inquiries and found that this was not the first time that such an animal had been seen in the district.

> Tracks of a sort of Tiger have been seen in Dalrymple's Gap by people camping there, and Mr. Reginald Uhr, now Police Magistrate at St. George, whilst one of the native mounted police officers in this district, saw the same animal my son describes.

This letter did not fail to impress the Fellows of the Zoological Society to whom Sclater read it on 7 November 1871. But more exact information was needed before they could pronounce unequivocally on the creature's existence. They did not have long to wait. On 4 December 1871 Walter J. Scott, C.M.Z.S., also wrote from Cardwell with recent news of the "tiger." A licensed surveyor called Hull, and five men working with him on the banks of the Murray and Mackay Rivers north of Cardwell, were woken up one night in their tent by a "loud roar." They leapt to their guns and cautiously explored the neighbourhood. The animal had gone, but around the camp there were tracks of a largish carnivore. A picture of a footprint was published with the letter in the *Proceedings of the Zoological Society*. Scott also recalled that in 1864 a bullock-driver said that he had met a tiger face to face in the area, but as he was a notorious liar no one believed him. Perhaps, after all, he had seen a similar animal.

Nonsense, wrote Gerald Krefft in another British scientific journal; the bullock-driver was certainly a liar, and Scott's footprint was an ordinary dog's! He was shocked that the Zoological Society should waste its money publishing such stuff.

Meanwhile, on 5 June 1872, Scott sent another more detailed report about this mythical cat from the Valley of Lagoons in Queensland. Robert Johnstone, an officer of native police, who was in the scrub with several of his men in the coastal area west of Cardwell, saw a large animal perched in a tree some 40 feet from the ground. When they approached it leapt 10 feet into another tree, clung to it, and then slithered down tail first. It was larger than a pointer and its colour was fawn with darker patches. Its head was quite round; they did not see its ears. Its tail was long and thick.

In 1895 there was serious alarm and a great deal of noise—at all events in the Press—about a "tiger" at Tantanoola in South Australia. The beast was hunted and finally shot. Its dismembered carcase was exhibited for all to wonder at. Alas, it was soon recognised to be a calf's, the show was closed, and those who believed in the "tiger" theory were

much disappointed, and consoled themselves by accusing the cowardly hunters of making a scapegoat of a poor calf. Another theory soon prevailed: that cattle-thieves had kept the "tiger" legend alive so that they could steal in peace and blame that bloodthirsty creature for their thefts.

Certainly there was plenty of talk of "tigers" at this time: one was reported at Moruya, another in Gippsland, a third in the forest near Colac and a fourth in Riverina. When the second was killed it proved to be a pig that had gone wild; the third was merely a wild dog that had escaped from captivity. There was now a tiger complex and people were seeing them everywhere, which naturally did not tend to make young Sheridan's story believed. But a shrewd observer would have remarked that whenever a report came from the north of Queensland it was more positive and more precise.

Thus in 1900, at Kairi, J. MacGeehan came upon a "striped marsupial cat" being attacked by a pack of dogs and crying piteously. It was clearly striped in alternate dark brown and white rings about 2½ inches wide. Its head was like a Pomeranian dog's and the length of the whole animal must have been more than 2 feet. No doubt it was a young one.

On another occasion the animal was even seen by a well-known naturalist, George Sharp, who was then looking for the eggs of the golden bower-bird (*Ptilonorhynchus*) near the source of the Tully River. One evening, as he was about to turn in, he heard a rustle in the scrub and came out of his tent. It was not yet dark and he could see an animal "larger and darker than the Tasmanian Tiger, with the stripes showing very distinctly." It had gone before he could raise his gun. A little later one of its brethren attacked a farmer's goats on the Atherton Tableland and was killed. Sharp heard of it and at once set off to the place where he was able to examine the animal's skin. It was about 5 feet long from the tip of its nose to the end of its tail. As he had no means of preserving the pelt at hand, it soon decayed. Wild pigs had already eaten the head and body.

A Mr Endres of Mundubbera in Queensland caught one of these "tigers" alive. He said it was "about 18 inches high and as long as a large cat; very short head and neck; striped, but not right round." It was "very savage when caught."

Ion Idriess, an Australian writer who spent his whole life in the wild north-east of the continent, mainly in Coen, has written an account that deserves to be quoted. He speaks of the mysterious creature as if it were a very familiar beast.

Up here in York Peninsula we have a tiger-cat that stands as high as a hefty, medium-sized dog. His body is lithe and sleek and beautifully striped in black and grey. His pads are armed with lance-like claws of great tearing strength. His ears are sharp and pricked, and his head is shaped like that of a tiger. My introduction to this beauty was one day when I heard a series of snarls from the long buffalo-grass skirting a swamp. On peering through the grass I saw a full-grown kangaroo, backed up against a tree, the flesh of one leg torn clean from the bone. A streak of black and grey shot towards the 'roo's' throat, then seemed to twist in the air, and the kangaroo slid to earth with the entrails literally torn out. In my surprise I incautiously rustled the grass, and the great cat ceased the warm feast that he had promptly started upon, stood perfectly still over his victim, and for ten seconds returned me gaze for gaze. Then the skin wrinkled back from the nostrils, white fangs gleamed, and a low growl issued from his throat. I went backwards and lost no time in getting out of the entangling grass.

It was not the only encounter.

The next brute I saw was dead, and beside him was my much-prized staghound, also dead. This dog had been trained from puppyhood in tackling wild boars, and his strength and courage were known by all the prospectors over the country.

This happened not far from the Alice River.

Among more recent reports I should mention P. B. Scougall and G. de Tournoeur who were riding from Munna Creek to the little town of Tiaro. Suddenly their horses shied.

We dismounted [they wrote to the *Brisbane Courier*] and were startled to find the cause to be a large animal of the cat tribe, standing about twenty yards away, astride of a very dead calf, glaring defiance at us, and emitting what I can only describe as a growling whine. As far as the gathering darkness and torrential rain allowed us to judge he was nearly the size of a mastiff, of a dirty fawn colour, with a whitish belly, and broad blackish stripes. The head was round, with rather prominent lynxlike ears, but unlike that feline there were a tail reaching to the ground and large pads. We threw a couple of stones at him, which only made him crouch low, with ears laid flat, and emit a raspy snarl, vividly reminiscent of the African leopard's nocturnal 'wood-sawing' cry. Beating an angry tattoo on the grass with his tail, he looked so ugly and ready for a spring that we felt a bit 'windy'; but on our making a rush and cracking our stockwhips he bounded away to the bend of the creek, when he turned back and growled at us.

Finally I should mention that the large striped cat has been known by the Queensland aborigines since the earliest times.

It is not therefore surprising that the eminent zoologist E. Le G.

Troughton, Curator of the Department of Mammals in the Australian Museum, should write:

> Although there is some divergence concerning the size of the animal and the disposition of the stripes, there seems some possibility that a large striped marsupial-cat haunts the tangled forests of North Queensland.

Nor would there be anything very odd about finding an Australian animal that looked like a cat. That this "tiger" or (more modestly) "tiger-cat" is a marsupial is very likely, since it lives in an almost exclusively marsupial world. As I have already remarked, Australia has, by a curious phenomenon of convergence, marsupials that resemble most types of placentary mammals. Besides kangaroos, which take the place of deer and antelopes, there are shrews (*Marmosa*), moles (*Notoryctes*), mice (*Sminthopsis*), rats (the various potoroos), rabbits (*Perameles*), squirrels (*Petaurus*), dormice (*Cercaertes*), jerboas (*Antechinomys*) and even large rodents of the coypu type (the wombats); genets (*Dasuridae*), wolves (*Thylacinus*), little bears (the Tasmanian devil or *Sarcophilus*) and even lemurs (the koala and the cuscus). Not long ago there were large ungulates between tapirs and rhinoceroses (*Diprotodon*), which may still not be quite extinct. It is also relevant that in South America there was once a whole group of marsupials corresponding to the larger carnivores of Africa and Asia: the Borhyaenidae. There was even a "sabre-toothed tiger" among them, the *Thylacosmilus*. Moreover, in Australia there was until quite recently a sort of marsupial lion, the *Thylacoleo*. It would be quite natural to find a smaller species of the same group on the same continent.

This large striped animal which has been well described as "a cat just growing into a tiger" is, of all the unknown animals dealt with in this book, the one nearest to being officially admitted by science. Although there is neither skeleton nor skin of it in any museum in the world, the "striped marsupial cat" of Northern Queensland was included in a standard work on Australian fauna in 1926 on the strength of the field observations which I have quoted from its text. The authors, A. S. Le Souef and H. Burrell, put forward a very subtle argument that the animal is a marsupial.

> Although there is nothing to indicate directly to what order this animal belongs, we believe it to be a marsupial, from the fact that it apparently cannot live in competition with the dingo. It inhabits the only country that the wild dog cannot penetrate.

I have already stressed the merciless war between marsupials and placentary mammals of the same type. The dingo, a mammal imported by man and now run wild, has driven out the larger carnivorous marsupials, especially the thylacine, wherever it has gone.

On the other hand, in South America it has been noticed that marsupials can survive perfectly well when there are no placentary mammals of their type, and fill the gaps that they leave. As Sir Richard Owen has remarked, if a fauna is to be in equilibrium it must have its carnivores, its insectivores, its herbivores, and so on. All the gaps must be filled. One can almost say that for this reason there *must* be a predatory marsupial in the mountainous forests of Queensland.

Le Souef and Burrell describe the "striped marsupial cat" of York Peninsula thus:

> Hair short, rather coarse. General colour fawn or grey, with broad black stripes on flanks, not meeting over the back. Head like that of a cat; nose more produced. Ears sharp, pricked. Tail well haired, inclined to be tufted at end. Feet large, claws long, sharp. Total length about five feet; height at shoulder eighteen inches.

It would be almost as big as the small clouded leopard (*Neofelis nebulosa*), or a cheetah (*Acinonyx jubatus*) with short legs.

So far it seems to be confined to Northern Queensland, where its habitat is "the rough, rocky country on top of the ranges, country usually covered with heavy forest, and inhabited chiefly by tree-kangaroos and rock-wallabies." But Le Souef and Burrell add:

> We have had a striped carnivorous animal described from North-west Australia, and Lord Rothschild states, from native reports, that a similar animal exists also in New Guinea.

And they point out very succinctly why such animals as the York Peninsula tiger-cat are not better known to science.

> This animal is rare, or, to be more correct, it lives in country that man seldom penetrates, and when he does so he creates such a noise in getting through the tangled undergrowth that any wary animal makes off.

There is a rather similar phenomenon in physics. It is theoretically impossible to shine a ray of light on to a particle in order to ascertain its relative position and velocity, without the impact of the light altering them and giving a false result. This impossibility of making extremely

small measurements led the German physicist Wernher Heisenberg to formulate his now-famous Principle of Uncertainty in 1925.

There ought to be a similar zoological principle, based on the difficulty of making field observations of large animals, man's natural rivals, which tend to disappear as soon as man arrives on the scene. The degree of difficulty depends on their habitat: obviously it is greater in the water than on land, and greater on land than in the air; greater in mountains than in plains; greater in the forest than in the savannah or the bush, and greater in the bush than in a sandy desert. This is why we know so little about the creatures of the sea and so much about birds—except those species that cannot fly. The difficulties are almost insuperable when two coincide, as they do in mountainous country with thick vegetation. That is why most unknown animals live in marshy or mountainous forests. It is a mere matter of logic.

CHAPTER TEN

The Moa, a Fossil that may still Thrive

Of fowles every kinde
That in this world han fetheres and stature
Men myghten in that place assembled fynde . . .
GEOFFREY CHAUCER, *The Parliament of Fowls.*

THE moa is the oddest of birds. It is, as far as we know, the largest bird that ever lived. Not only is it unable to fly (like the other running birds, or Ratitae, such as the ostrich, the emu and the cassowary, which it resembles a little in outline), but it has not the smallest trace of wings. There is not even a sign of the collar-bone with which a vertebrate's front legs are almost invariably connected to the thorax. It is the truest of bipeds, and its feathers are so primitive that they seem more like hairs.

But though a wingless furry bird might be a freak elsewhere it would not be out of the ordinary in New Zealand. There is a marked tendency among many different groups of birds on those islands to lose their powers of flight. There are rails which have forgotten how to fly, such as the *weka* or Maori hen (*Ocydromus*) and the *takahe* (*Notornis*), to which I shall be returning later. There used also to be wingless cranes (*Aptornis*). And there is a parrot known as the *kakapo* or owl-parrot (*Stringops*), which has not only become nocturnal (an odd enough thing for a parrot to do), but has also turned burrower, which is thoroughly odd for a bird. Its wings are well developed, but it has lost its breast-bone, that bony keel indispensable to flight. It lives in holes under rocks and the roots of trees.

New Zealand is the sole home of two families of wingless and tailless birds with hair-like plumage: the kiwis and the moas, known to science as Apterygidae and Dinornithidae; while the kiwis have vestiges of wings

Bay of Islands
Auckland
TASMAN
SEA
NORTH
ISLAND
C. Runaway
R. Wharekahike
Bay of Plenty
Hick's Bay
East Cape
Hikurangi
Mt.
R. Waiapu
L. Rotorua
Taranaki
Ruapehu
Whaiti Mts.
L. Taupo
Gisborne
Poverty B
Mt. Egmont
Takaka
Riwaka
Nelson
Cook Str.
Wellington
Cloudy Bay
Buller R.
Marlborough
Grey R.
Kaikoura
PACIFIC
OCEAN
Alps
L. Heron
Mt. Cook
Christchurch
Ashburton
SOUTH
ISLAND
Arowhenua
Timaru
Waimate
Secretary I.
L. Te Anau
Thompson Sd
Resolution I.
Dusky Sd
Preservation Inlet
Waikouaiti R.
Dunedin
Otago Peninsula
Invercargill
Molyneux Harbour
Stewart I.
Miles
0 50 100 150 200
Forests

beneath their feathers, the moas are completely wingless. Only one genus of kiwis, *Apteryx*, seems to survive today; it includes three very closely related species. The kiwi is a nocturnal forest bird as big as a chicken. Its appearance, a little head and long beak sticking out of a bunch of dark brown silk, is familiar from the many pictures of it as the national emblem of New Zealand and a trade mark for boot-polish. It is less well known that its nostrils are in the tip of its burrowing beak and it is the only bird that finds its food by smell—indeed the only one that has a highly-developed sense of smell. While the African ostriches have only two toes on each foot and their Australian cousins the emus have three, the kiwi still has a dim vestige of a fourth toe at the back of the foot. It is better developed in the other family of New Zealand

63. The New Zealand kiwi.

running birds, the Dinornithidae. These are the moas, of which various authors have described from 21 to 38 species belonging to five distinct genera, though they are all—officially at least—said to be fossils.

It is usual to talk of kiwis as dwarfs and moas as giants. The truth is less simple. The largest moas, such as the *Dinornis robustus*, stood nearly 12 feet high—3 feet higher than the tallest ostrich—but some, like the *Anomalopteryx parva*, were no bigger than a turkey. On the other hand, it is generally admitted that not long ago there was—and perhaps still is—a giant Apteryx (*Apteryx maxima*) which was just the same size. But it has not been proved that the pygmy moa and the giant kiwi are not one and the same animal, for the latter is known only from the vaguest evidence. Where do kiwis end and moas begin? If one is to go only by external appearance there is no difference except for the length of the

beak, and this is not an absolute criterion. One also has to know the exact position of the nostrils, not an easy thing to verify without the bird in the hand. In fact all these wingless, furry-looking birds would be remarkably alike even if they were not so closely related.

Why, you may ask, is it in New Zealand rather than elsewhere that birds tend to lose the use of their wings, and even their wings themselves? The answer is to be found in a fact which Captain Cook was observant to notice when he explored the New Zealand archipelago in 1773, and found no quadrupeds except dogs and rats.

These dogs and rats were obviously introduced by the natives, so there were no indigenous quadrupeds in this country. Thus there were no carnivores that eat birds.

In islands where there are no predatory mammals, birds no longer need to take to the air at the least danger, but can relapse into a lazy terrestrial existence—with fatal results. It is hardly surprising that most birds that have become extinct in historic times have lived on islands, inaccessible to carnivores, where they have given up flying. For sooner or later man and his parasites, the dog and sometimes the cat, come to disturb the peace. The most celebrated victim is the dodo of Mauritius (*Didus ineptus*), a huge flightless pigeon which man exterminated in less than a century. Its name is a very symbol of extinction: as dead as the dodo.

Of all the islands of any size, the most isolated from any mainland are the North and South Islands of New Zealand. They are more than 1,000 miles from Australia, the nearest land. In the middle of the Mesozoic era, during the Jurassic period, these islands were attached to South-East Asia by a broad causeway that included New Caledonia, the New Hebrides, the Solomon Islands and New Guinea. It even reached to Australia. But before the end of the following period, the Cretaceous, it sank under the waves, leaving only a few scattered islands and cutting off New Zealand for ever from the rest of the world. This happened shortly before the great invasion of marsupials, which were thus unable to spread beyond Australia. Since then the only access to New Zealand has been by air or by sea. There the only known indigenous mammals are two species of bats, both called *pekapeka* by the Maoris; one, *Chalinolobus*, also lives in Australia, the other, *Mystacina*, is found only in New Zealand. This country could hardly be accidentally populated by creatures carried there on floating tree-trunks, a common enough process between the galaxies of islands, each close to the next, in Oceania.

When land mammals first set foot on New Zealand it was because they had deliberately steered the tree-trunks there which they had hollowed out into boats, for they were men. They brought with them their faithful companion the dog, *kararehe*, now vanished. The rat *kiore* (*Mus exulans*) had certainly not been invited, but its arrival was no accident.

Any species of land quadruped that existed in New Zealand before this invasion would have to be very ancient, for it would have to have been there since the Jurassic period at the latest. Such a quadruped exists. It is the only remaining survivor of the Rhynchocephalians, a group of reptiles older, geologically speaking, than the dinosaurs, the tuatara (*Sphenodon punctatus*), a strange three-eyed lizard which usually shares its home with a petrel (see plate between pages 72 and 73). Just as Australia is the last retreat of a past age of marsupials, so New Zealand shelters the last representative of a reptilian empire that flourished nearly 200 million years ago.

During the long period between New Zealand's isolation and its invasion by man, birds were able to develop richly and into the wildest forms, such as the giant moas. After losing their power of flight, the birds in the two main islands evolved along different lines, as is explained by Professor Ferdinand von Hochstetter of Vienna, one of the greatest experts on the natural history of New Zealand.

> . . . as the Apteryx species of the two Islands are different, so also the Moa species of North Island seem to be different from those found on South Island. Cook Strait, now separating the two islands, may have proved to these birds, which could neither fly nor swim, an unsurmountable obstacle, preventing them from migrating from one island to the other. New Zealand was perhaps a large continent when the Moas were first created. And if we suppose this or at least that the two islands were formerly contiguous to each other, we of course suppose also, that the separation took place so long a time ago, that the originally identical species, after the separation of both islands, may have been changed in course of time into the present varieties or species.
>
> According to Prof. Owen, the birds of South Island present stouter proportions, a compact, rather bulky frame of body, such as *Dinornis robustus*, *elephantopus*, *crassus* and *Palapteryx ingens*, while those of North Island are distinguished by more slender and lengthy forms, like the *Dinornis giganteus* and *gracilis*.
>
> These various species inhabited the plains and valleys and had their hiding-places in forests and caves. Their food doubtless consisted of vegetables, especially fern-roots, which they dug up with their powerful feet and claws. To assist the process of digestion, they swallowed small pebbles.

64. The conventional reconstruction of a large moa.

This we know because heaps of small round stones, usually chalcedony, cornelian, agate and opal, are often found with the bones of moas or occasionally by themselves. Presumably these round pebbles came from the moas' stomachs, for their cousins the ostrich and the emu are in the habit of swallowing small pebbles to help grind the food and of regurgitating them from time to time when they have been worn quite smooth.

The formation of the skull [Professor von Hochstetter goes on] leads us to infer that they were stupid, clumsy birds, which we must not suppose to have been swift runners like the ostrich, but sluggish diggers of the ground, the nature and habits of which demanded no larger scope, than such as the limited territory of New Zealand presented.

Indeed the moa hardly seems to deserve its scientific name of *Dinornis*, or "terrible bird," given it by Sir Richard Owen. On the contrary, it is the very type of a bird that has grown soft from too easy a life and whose days will be numbered as soon as the first enemy arrives. But did man exterminate the moa? Yes, say some, going so far as to cite the evidence of Maoris who point out a Totara tree on Lake Rotorua as the place where their ancestors killed the last moa.

> But for those colossal birds [says von Hochstetter], it would be indeed utterly impossible to comprehend how 200,000 or 300,000 human beings could have lived in New Zealand, a country which even in its vegetable world offered nothing for subsistence, except fern-roots.

And he attributes the Maoris' cannibalism to their lack of meat when these wonderfully large and plump birds began to fail. But we know today that habitual cannibalism is never merely the result of famine, and that it derives from a magical belief that one can acquire the virtues of the dead by digesting their bodies. No doubt the Maori cannibalism is as old as the race itself.

Others no less hotly deny that man exterminated the moa, but this denial can have two diametrically opposite meanings. Some say that the moa could not have been exterminated by man, because it was already extinct when he arrived. The degeneration of this overgrown bird, reflected in its bones, made the moa die out. Perhaps floods drowned many of these birds that could no longer fly, and doubtless the violent volcanic eruptions, of which traces have been found, helped to destroy a large population. But others say that the moa has not been exterminated by man because it is not yet utterly extinct, and this giant bird, or at all events *some* moa of smaller size, survives in unexplored regions of New Zealand. The extraordinary diversity of opinion on this subject is largely a result of the bitter controversy aroused by the original discovery of the moa.

The history of the discovery of the moa is even more confused than the history of the moa itself. For more than a century men have been trying to solve the mystery that surrounds it; and there is no doubt that some of them, whether from vainglory, incompetence or disbelief, have ironically only helped to darken the mystery the more. When the moa was discovered it was variously pronounced to be a contemporary of present-day man, a bird only recently extinct, and a complete fossil. Each of these opinions had its own belligerent faction which became ever firmer in its own conviction, after searching systematically for

arguments to support its theory and neglecting any evidence that might weaken it. Let us try to follow the moa's discovery without any such bias.

It officially entered the world of science in 1839 when a fragment of a huge bone was brought back from New Zealand by a traveller named Rule and eventually reached the hands of Professor Sir Richard Owen. The bone seemed to have belonged to an ox, but after careful study he realised that it was a bird's femur. On 12 November 1839 he read a note on this sensational discovery to the Zoological Society of London in which he said:

> Any opinion . . . as to its specific form can only be conjectural; . . . but so far as my skill in interpreting an osseous fragment may be credited, I am willing to risk the reputation for it on the statement that there has existed, if there does not now exist, in New Zealand, a Struthious bird nearly, if not quite, equal in size to the Ostrich.

There was no doubt that such a bird had once existed when Rule's bone had been identified by such a leading comparative anatomist as Owen. But that it could still exist or be known to man seemed unlikely to many people. Captain Cook had heard nothing of it when he visited New Zealand in 1773 and questioned Chief Tawaihura at some length about the local fauna. And plenty of travellers had been there since, and not a single work about the country made the least mention of this extraordinary bird. This latter objection may have been true until 1839, but it was so no longer. A Jewish merchant called J. S. Polack had just published two volumes about New Zealand. He had spent more than two years, between 1834 and 1837, on the east coast of North Island, where he said:

> That a species of the emu, or a bird of the genus Struthio [ostrich], formerly existed in the latter island, I feel well assured, as several large fossil ossifications were shewn to me when I was residing in the vicinity of the East Cape, said to have been found at the base of the inland mountain of Ikorangi [Hikurangi]. The Natives added that, in times long past, they received the traditions, that very large birds had existed, but the scarcity of animal food, as well as the easy method of entrapping them, has caused their extermination.

This would have satisfied those who thought the moa was recently extinct and explained why Captain Cook had heard nothing of such a monstrous bird being still alive. But Polack goes on to say:

> Yet, doubtless, the future ornithologist will be surprised by discovering, among the hidden mountain-gorges and wilds of the Island

of Victoria [i.e. South Island], many birds at present supposed to be no longer in existence.

I feel assured, from the many reports I received from the natives that a species of struthio still exists on that interesting island, in parts, which, perhaps, have never yet been trodden by man. Traditions are current among the elder natives of Atuas,[1] covered with hair, in the form of birds, having waylaid native travellers, among the forest wilds, vanquishing them with an overpowering strength, killing and devouring, &c. The traditions are reported with an air of belief that carries conviction to the younger natives, who take great delight in the marvellous and the improbable.

Although a New Zealand printer and amateur naturalist called William Colenso was later to maintain that Polack did not even know how to write—so that he could pretend that he himself was the first to mention the moa—the book is still the first record of the giant bird. Thus when Owen published his first article on the subject he mentioned in a discreet note that Polack's fossil bones were those of a bird and that therefore the native traditions he reported were correct. But we should note in passing that Polack never spoke of "fossil" bones, that he said himself that the giant bones shown him were those of a bird, and that his book came out before Owen had pronounced favourably upon Rule's femur. There is no proof that the zoologist had not read Polack's book before he published his conclusions.

Colenso can, however, claim to be the first to mention the name *moa* in print. In December 1837, the Rev. William Williams, a protestant missionary, had just published the New Testament in Maori, and decided to take several weeks' well-earned holiday with his printer and friend, Colenso. They left the Bay of Islands on 1 January 1838. Colenso reported in the *Tasmanian Journal of Natural Science*:

During the summer of 1838, I accompanied the Rev. W. Williams on a visit to the tribes inhabiting the East Cape District. Whilst at Waiapu, (a thickly inhabited locality about 20 miles S.W. from the East Cape) I heard from the natives of a certain monstrous animal; while some said it was a bird, and others "a person," all agreed that it was called a *Moa*;—that in general appearance it somewhat resembled an immense domestic cock, with the difference, however, of its having a "face like a man;"—that it dwelt in a cavern in the precipitous side of a mountain;—that it lived on air;—and that it was attended, or guarded, by two immense *Tuataras* [*Sphenodon*], who, Argus-like, kept incessant watch while the *Moa* slept; also that if any one ventured to approach

[1] The Maori name for all supernatural beings from the supreme being down to mere demons.

the dwelling of this wonderful creature, he would be invariably trampled on and killed by it.

On the strength of this Colenso pretended that he was the first white man to learn that a giant bird existed in New Zealand. But it seems clear to me that he did not believe a word of these fantastic legends, or he would have discussed them with Williams. For when this missionary returned to the east coast a year later in January 1839 with a brother missionary, the Rev. Richard Taylor, he had obviously never believed any story about giant birds—he may not even have heard them. So it would appear from Taylor's narrative:

> In the beginning of 1839 I took my first journey in New Zealand to Poverty Bay with the Rev. Wm. Williams (the present Bishop of Waiapu). When we reached Waiapu, a large pa near the East Cape, we took up our abode in a native house, and there I noticed the fragment of a large bone stuck in the ceiling. I took it down, supposing at first that it was human, but when I saw its cancellated structure I handed it over to my companion, who had been brought up in the medical profession, asking him if he did not think it was a bird's bone. He laughed at the idea, and said, what kind of bird could there be to have so large a bone? I pointed out its structure, and when the natives came requested him to ask them what it belonged to. They said it was a bone of the Tarepo, a very large bird which lived on the top of Hikurangi . . . and that they made their largest fish-hooks from its bones. I then inquired whether the bird was still to be met with, and was told that there was one of an immense size which lived in a cave, and was guarded by a large lizard, and that the bird was always standing on one leg.

Having bought the bone from the headman of Waiapu for a little tobacco, Taylor sent it to England, where it eventually reached Owen's hands through Sir Everard Home, but not until he had already seen Rule's femur and published a note about it. So Taylor's claim is as unjustified as Colenso's when he writes in *Te Ika a Maui, or New Zealand and its Inhabitants* (1855), "I first discovered its remains in 1839, at Tauranga [Gisborne] and Waiapu."

When Taylor returned to the Bay of Islands in February he met another person who had come from Taranaki on the west coast and also claimed to have heard of the moa, the German naturalist Dr E. Dieffenbach of the New Zealand Company. When he tried to climb Mount Egmont, a native chief dissuaded him because the mountain was guarded by a moa or *movie.*

Colenso was then a neighbour of Dieffenbach at the Bay of Islands, so he probably learnt the German traveller's story and was reminded of the

fantastic tales he had heard earlier about a devil-bird with a human face. When, like Dieffenbach, he had an opportunity of examining the bones that Taylor had brought back—in particular a toe—he must have realised for the first time that the native legends were not utterly without foundation.

Two years later Colenso decided to find out more about the mysterious bird. He set sail on 19 November 1841 from the Bay of Islands on a little boat for Poverty Bay. But he landed much sooner, at Wharekahike, in Hicks Bay, between Cape Runaway and East Cape, and continued his journey south on foot, to Rangitukia, a large settlement of the Ngatiporou tribe on the left bank of the River Waiapu. There he obtained his first moa bones: five femurs, a tibia and one unidentified bone. At Poverty Bay he met his old friend the Rev. William Williams, who had been installed as archdeacon at Turanga a year before. He had also collected a number of moa bones from the natives, intending to send them to Professor Buckland at Oxford. Colenso added some of his finds to this collection, but we shall see later that he tried to send his own specimens to the highest authorities. Leaving the archdeacon, he went on scouring the east coast, asking the Maoris everywhere whether they knew of moa bones, and eventually reaching the neighbourhood of the chalky headland of Whakapunake, where, according to the traditions he had collected four years before, a moa lived in a cave and terrified the whole district. But the local natives sent him away elsewhere under the pretext that the moa now lived in the Whai-iti Mountains. Another time the natives showed Colenso a footprint in a clayey rock, a little beyond Hicks Bay. They said it was that of Rongokako, one of their famous ancestors. The next footprint was near Poverty Bay, more than 80 miles away—outdoing even the seven-league boots of fable! Colenso did not guess that it had been made by the creature whose bones he was collecting, but later it was found to be a moa's footprint.

When he returned to the Bay of Islands in April 1842 he feverishly set about completing his collection of moa bones so that he could send them post-haste to his friend Sir William J. Hooker for Sir Richard Owen. Meanwhile he wrote an account of his own views about the giant bird, which he sent to the *Tasmanian Journal of Natural Science* where it appears in the volume for 1846.

Determined at all costs to be the first to have told the world of the giant fossil bird, Colenso always swore that he had never seen Owen's 1839 note, nor to have heard of it or have met any settler that knew of it. In fact the New Zealand papers, as one might expect, were full of echoes

of this local wonder after Owen's note appeared, and more than a hundred offprints of the note itself were distributed in New Zealand. The missionaries, in whose wake Colenso followed, were the most educated of the settlers and in closest contact with the natives and would have certainly been the first to receive copies.

Many people in New Zealand claimed to be the first: the first to hear legends of the giant bird, the first to hear the native name of *moa*, the first to collect its bones. And as they often distorted the truth and contradicted themselves in order to establish their claim, the first reports have often seemed suspect since. They seemed even more suspect when there were obstinate rumours that the moa survived. It was no longer possible to pretend to be the first to have seen bones or heard the name, so perhaps people were looking for another claim to fame: to be the first to see a living moa? The seed of scepticism was sown.

In 1842 Archdeacon Williams sent a vast quantity of moa bones packed in huge wicker baskets to Dr Buckland, who gave them to the Royal College of Surgeons. From these bones Sir Richard Owen was able to reconstruct among other things the enormous legs of *Dinornis giganteus*, which must, by his reckoning, have stood more than 10 feet high. He also established that there were at least four different species of varying height and bulk. These were the conclusions of a second note on the moa which Owen published in January 1843 in the *Proceedings of the Zoological Society*.

Then moa bones were found in South Island for the first time, at the mouth of the Waikouaiti, on the north of the Otago peninsula, by Percy Earle and Dr MacKellar. But the richest harvest of all was undoubtedly that which Walter Mantell, Secretary for Crown Lands and son of the famous geologist and palaeontologist Gideon Algernon Mantell, collected on both islands between 1847 and 1850. It included no less than 1,000 separate bones and even pieces of the shells of huge eggs that would have been as much as 10 inches long. All these precious remains were acquired by the British Museum of Natural History, and completed the rich material upon which Sir Richard Owen based his now famous monograph *On Dinornis*. Among Mantell's bones was the skeleton of a moa hardly 5 feet high, but so heavy and massive that Owen called it *Dinornis elephantopus* ("the terrible bird with elephant's feet"). Thus there were not only versions of attenuated giraffes and small turkeys among the moas, but even of pachyderms.

But when did these legendary birds live? Disregarding native

traditions completely, one can draw valuable conclusions from the bones and from the geology of the material in which moas left their footprints. Some of the disinterred bones are, it is true, unquestionably fossilised and can be dated from the middle of the Miocene period some 15 to 35 million years ago. But most moa bones are in a *sub-fossil* state. That is to say they have not had time to "petrify," or be impregnated with mineral salts.

> The almost undecomposed state of the bones [writes von Hochstetter], their occurrence in the sands of the sea-shore, in swamps, forests, river-beds, and in limestone caves, together with bones of animals still living in New Zealand, all this proves beyond the shadow of a doubt, that those birds belong to the recent period of the earth, and that their age can only be counted by hundreds, instead of thousands of years.

As the Maoris had hardly settled in New Zealand two or three centuries before it was sighted by Tasman in 1642, the relative freshness of the bones is not enough to prove for certain whether man ever knew the living moa. Moreover, in exceptional conditions bones may remain in a sub-fossil state for as long as 20,000 or 30,000 years. We must therefore turn to the local traditions.

The legends that Polack collected, to say nothing of Colenso's, hardly indicate an intimate knowledge of the living bird. Nor does the devilish and savage nature that the natives along the east coast attribute to the moa agree with what one can infer about the bird's habits, which must have been more sluggish than the ostrich's. Its description as a sort of giant cock with a man's face seems very fanciful. And the fact that the Maoris attributed its footprint to legendary heroes or demigods seems to prove that they could not have known it. These arguments drove a New Zealander called H. Hill to conclude in 1914 that "not a single Maori known to the missionaries and early settlers ever saw or heard of a moa, or of its having been seen by any of their ancestors." According to him everything that the natives said about the moa was a myth based on the discovery of huge bones and on what they had learnt from white men. He even went so far as to ask if the very word *moa* was not derived from English. On 16 July 1912 Urupani Puhara, an old Maori chief of 88, had told him at Pakipani that:

> The "moa" was not the name by which the great bird that lived in this country was known to my ancestors. The name was "Te Kura," or the red bird; and it was only known as "moa" after the pakehas [white men] said so.

Hill consulted an expert on Maori folklore, Colonel P. Porter, C.B., of Gisborne, who had an amusing version of the word's origin that he had heard from an educated half-caste: when the remains of the moa were first discovered, the missionaries and other travellers pestered the natives with demands for "more bones" which the Maoris had understood as "moa bones," taking "moa" to be the name of the vanished bird. But Colonel Porter was sceptical of this tale, since he recalled a very old proverb *Ngaro a moa* (lost like the moa), an odd Maori equivalent of "as dead as the dodo."

According to Berthold Seemann, the word *moa* in the Fijian form, *toa*, means a domestic fowl, while the Polynesian name for a flying bird is *manumanu*, and that since the Maoris used the word *moa* they must have known that the moa could not fly and hence they knew the living bird. Colenso also produced several convincing arguments that man and the moa lived at the same time. The word *moa* appears in many names of people and places: for instance *Pukumoa* (moa's belly or entrails), *Taramoa* (moa's spur), *Moawhanganui* (moa long waited for), *Tawakeheimoa* (Tawake able to yoke a moa). It is true that the word *moa* is sometimes also used for a hairy waving flaccid and coarse growing seaside grass (*Spinifex hirsutus*) but it may well have been named after the bird's hairy plumage. And not only its leaves, but also a local variety of flax (*Phormium*), which provides a textile fibre, are called *raumoa* or "moa's feather." However, it is clear enough that the personal and place names mentioned above could not refer to a plant.

Colenso says that *maimoa* is the Maori word for the false birds that they use as decoys for hunting. Perhaps their ancestors dressed in moa-skins to deceive the huge birds into letting them come within striking distance. The fact that ostriches seem to find it refreshing to open their beaks wide into the wind may explain why the Maoris of the east coast believed that the moa, which doubtless had similar habits, lived on nothing but air. Colenso also tells us that *moamoa* or *hamoamoa* is the native name for the little round and shiny stones that are sometimes found in small heaps. It has since been discovered that these pebbles come from moas' stomachs. Their name shows that the Maoris knew this fact long before we did, and evidently from direct observation. Colenso, who did not have this last vital piece of evidence, concluded that New Zealanders had known the moa until prehistoric times (long before the beginning of their tribal history which went back twenty-five generations, or about 500 years).

Hill came to exactly the opposite conclusion: that the moa died out

in the Pleistocene period, and probably at the beginning of it, between 300,000 and a million years ago. This is contrary to the palaeontological evidence and betrays surprising ignorance of some aspects of the problem.

All the first reports about the moa—upon which Hill based his arguments—came from North Island, and especially from the east coast. It seems likely that the natives in this area did not know the moa directly. But could they have known that the huge bones belonged to a bird? They were not expert palaeontologists. One might argue that since almost all the other animals on the islands were birds they would have assumed it to be a bird, and the remains of its eggs would have confirmed the theory. For there is little doubt that the Maoris knew these eggs and thought they had magical properties.

In 1865 a London naturalist called J. S. Stevens received from New Zealand a *Dinornis* egg in almost perfect condition. According to the Wellington newspapers this egg, which was $10\frac{1}{4}$ inches long by $7\frac{3}{4}$ inches wide, had been discovered in an ancient tomb at Kaikoura in the district of Marlborough. A human skeleton, in a sitting position, had held the egg in its hands.

The natives could have deduced the bird's existence from the same evidence as white man, but how did they come to know what its plumage was like? Polack, it will be recalled, refers to "Atuas, covered with hair, in the form of birds." Of all the New Zealand birds only the kiwi has feathers like silky hair, and it is incredible that the natives should have known that the bones and eggs belonged to an outsize kiwi and not to some other type of bird.

Thus everything tends to show that if the Maoris of the east coast of North Island did not know the moa themselves or from their immediate ancestors, their legends are still originally based on an exact description of the bird. Other men must therefore have known it, travellers, perhaps, from more southerly corners of New Zealand. And, indeed, when Governor Fitzroy had a friendly meeting in 1844 with the Maoris at Wellington at the very south of North Island he had to admit that they knew the huge birds as well as one would expect these huntsmen to know their favourite quarry which was now, alas, no more. Haumatangi, an old Maori of 85 who boasted that he had seen Captain Cook in 1773 when he was only 14, said that he had seen a moa for the last time two years before that memorable date. Kawana Papai, another no less ancient native, maintained that he had himself taken part in moa-hunts

on the Waimate plains in South Island some 50 years before. He gave very exact details of this sport. The birds were rounded up, encircled and then killed with spears—not an easy task or a safe one, since the moa, like the ostrich, fought hard, laying about it with terrible blows of its feet. The Maoris made use of the fact that it had to stand on one leg in order to kick with the other. One party attacked it in front and goaded it into lifting one leg while another party attacked the other leg with long sticks from behind. The moa-hunters used special spears which were designed to break off inside the bird's body. Once dead, it was cut up with an obsidian knife, and eaten at gargantuan feasts.

This seems to be confirmed by the fact that on both North Island and South Island, Mantell and another naturalist called Cormack often found mounds full of charred moa bones near native camps and settlements, the remains, no doubt, of these meals.[1] Thus, for the natives of South Island and of the south of North Island, the moa, which might weigh as much as a quarter of a ton, was as welcome in the larder as a Christmas turkey, and became more and more appreciated as the game grew scarcer. It aroused none of the terror that one finds in the tales from the east coast of North Island, which perhaps had come from much further south and been confused in the telling.

On South Island, not only have fresher remains of moas been found, mummified pieces of the body, the skin and brownish feathers with white tips still preserved, but much more widespread and detailed native traditions have been collected. Von Hochstetter relates some of the more common legends:

> Ngahue, one of the discoverers of New Zealand,—so tradition says,—describes the land as the haunt of colossal birds. There are yet some Maori poems extant, in which the father gives his son instructions how to behave in the contests with the Moas, how to hunt and kill them. . . .
>
> The birds being unable to swim, were driven towards a river or a lake, or towards the sea-coast, until they could escape no further, and thus slain. That also small heated stones were thrown into their way, which they swallowed and of which they died, is probably a mere Maori fable.

I wonder. Remembering how stupidly and gluttonously an ostrich will swallow any bright little object that it finds in its way, sometimes causing a fatal haemorrhage (most ostriches in zoos come to this end),

[1] According to the recent research by Dr R. A. Falla of the Dominion Museum, Wellington, the moas which the Maoris hunted were mainly if not entirely of the species *Euryapteryx gravis*.

I think it very likely that one could kill equally stupid birds by strewing their paths with white-hot pebbles. In any case, whether this technique was imaginary or not, it could only have been invented by someone who knew the moa's habits very well. Hochstetter also cites from Maori tales the use that was made of the moa:

> The flesh and eggs were eaten; the feathers were employed as ornament for the hair; the skulls were used for holding tattooing powder; the bones were converted into fish-hooks, and the colossal eggs were buried with the dead as provision during their long last journey to the lower regions.

The Maoris said it had a brilliant plumage and a high crest on its head. Altogether it looked like a huge Cochin cock, a fat, gallinaceous bird with feathered legs. This apparently absurd description has been used as evidence that the Maoris had never seen moas. Actually it is our reconstruction that is more likely to be absurd. It is largely based on one of the running birds still extant in Australia, the emu, which has bare legs and sober greyish-brown plumage. But we have no proof that *some* moas at least did not have brilliant plumage like that other Australian bird, the cassowary. The brown feathers that have been found may belong to females, usually duller in colour than the males. Why do we always draw the moa with a bare neck like an ostrich, when it could have been as thickly feathered as an emu's, which would have completely altered its outline? And there is no evidence that the moa did not have feathered legs like a Cochin hen and like the kiwi itself. Only a fast-running bird of the plains has any advantage in bare legs, and the moa was not one. In any case the largest moas were not built for running. Finally, the cranial structure of some of the Dinornithidae indicates that they had a sort of crest on their heads, thus confirming the Maoris' picture.

Thus it seems that innumerable moas still lived in New Zealand when it was first invaded by man. He came from the north, and both islands would logically have been invaded from the north or north-west and the moa would have been driven farther and farther to the south. On both islands moa bones have been found in the largest quantities in the south-east. Likewise North Island was almost certainly invaded before South Island, and the moas were therefore exterminated there first. In any case there is little doubt that most of the moas on North Island had vanished 500 years before man arrived on the island, which explains why the Maoris whom Cook questioned, in the north and west of the island, had never heard of the bird. Perhaps a few isolated flocks of birds were

killed as late as 1800 in the extreme south of the island, as the remains of feasts indicate, but almost all of the accounts reported by Governor Fitzroy were either based on tradition or came from Maoris on the other side of Cook Strait. In South Island it is well-established that the moa

65. Probable appearance of some moas, according to the Maoris who knew them.

—particularly *Euryapteryx gravis*—was not only well known to the Maoris at one time, but played such an important part in their lives that Roger Duff could write a learned work entitled *The Moa-Hunter Period of Maori Culture* (1950). According to him this period ended in the sixteenth century. But there is also proof that in South Island the moa survived until very recently and certainly existed when New Zealand

was discovered by white men. All that remains is to discover just when the last of the moas died.

Colenso thought that the moa survived in South Island at the beginning of the nineteenth century. The Rev. Richard Taylor remarked in the middle of the same century "that it was by no means certain that it was extinct even then." In Owen's second note, published in 1843, he repeats rumours heard by Archdeacon Williams that moas still lived in "Middle Island" (the old name for South Island). And in 1863 von Hochstetter wrote lyrically in his excellent book about New Zealand —a country that he knew very well—"It is by no means impossible that in lonely and inaccessible places live a few scarce diehards of the giant family: the last of the Mohicans." There is some evidence to support this theory. At the beginning of the nineteenth century American sailors and sealers claimed to have seen monstrous birds 12 to 15 feet high (an exaggeration, no doubt) running to and fro along the coast of Cloudy Bay, on South Island, and on the inhospitable shores of the south-west of that island. According to a letter from Taylor published in April 1850 in the *New Zealand Magazine* a sealer called Meurant found moa bones still covered with flesh in 1823 at Molyneux Harbour on South Island. Finally there is this report quoted from the *Nelson Examiner* of 12 January 1861 by von Hochstetter:

> In June, while Messrs. Brunner and Maling, of the Survey Office, were surveying on the ranges between Riwaka and Takaka, they observed one morning the foot-prints of what appeared to be a very large bird, whose track, however, was lost among the scrub and rocks. The foot-prints were 14 inches in length, with a spread of 11 inches at the points of the three toes. Similar foot-prints were seen on a subsequent morning, and as the country is full of limestone-caves, it is thought that a solitary Moa may yet be in existence.

Von Hochstetter did not believe all these stories. According to him the largest living running bird in New Zealand was certainly a giant Apteryx (*Apteryx maxima*), although actually no more is known about this bird, which is included in the present fauna of New Zealand, than about the supposedly extinct moas.

Three species of kiwis are well known today, although they are rarely seen because of their nocturnal habits: *Apteryx mantelli* confined to North Island, *Apteryx australis* confined to South Island, and *Apteryx oweni* found in both. Where two kinds are found together the Maoris

differentiate them by their size, calling the larger *kiwi-nui* and the smaller *kiwi-iti*. None of them is larger than a domestic fowl. But there is every reason to believe that there was once a much bigger species called by the very different name of *roa-roa*. Von Hochstetter writes:

> Mr. John Rochfort, Provincial Surveyor in Nelson, who returned from an expedition to the western coast of the province while I was staying at Nelson, in his report, which appeared in the Nelson Examiner, of August 24th, 1859, describes this species, which is said to be by no means uncommon in the Paparoa ranges, between the Grey and Buller rivers, in the following terms: a Kiwi about the size of a turkey, very powerful, having spurs on his feet, which, when attacked by a dog, defends himself so well as frequently to come off victorious. My friend, Julius Haast, writes to me in a letter dated July, 1860, from ten miles above the mouth of the river Buller, on the mountains of the Buller chain, which at the height of from 3000 to 4000 feet, were at that time, it being winter in New Zealand, slightly covered with snow, that the tracks of a large Kiwi of the size of a turkey were very common in the snow, and that at night he had often heard the singular cry of this bird, but that as he had no dog with him he had not succeeded in getting a specimen of it.

The news in the *Nelson Examiner* came soon after the publication of Darwin's *The Origin of Species*, zoology was in fashion, and everyone was interested to know if some primitive bird of the moa tribe still lived in remote New Zealand mountains. Darwin himself had said it was possible.

I do not believe that any bones of this mysterious large kiwi have ever been found. There are only a few scraps of skin covered with feathers which adorn a Maori chief's ceremonial cloak. So why have some authorities considered it as a member of the genus *Apteryx*? Kiwis have no "spurs" or well-developed hind claws. Would it not therefore be more likely to be a small moa, an *Anomalopteryx* for instance, which was exactly the size of a turkey? Perhaps they preferred to call it an *Apteryx* so that they could assert categorically that every moa was extinct. But is it more reasonable to assert that there is a giant kiwi that no one has ever seen?

Sir George Grey confirms Maori reports that a little moa survived very recently. He is quoted in Sir Walter Buller's classic work, *A History of the Birds of New Zealand*:

> Sir George Grey tells me that in 1868 he was at Preservation Inlet and saw a party of natives there who gave him a circumstantial account of the recent killing of a small Moa (?*Palapteryx*), describing with much spirit its capture out of a drove of six or seven.

And one must accept the word of a man who was to become Prime Minister of New Zealand. Indeed it is not impossible that much larger moas may have survived until today. We know from Maori evidence that they were shy birds that liked to be alone. It has always been supposed that the Dinornithidae, like other running birds, preferred to live in grassy plains. Actually they were a very varied family, large and small, slender and squat. It is very likely that the different kinds had no less different habitats, and that there were slim moas of the plains, little moas of the forests, and heavy moas of the marshes—like the Madagascan Aepyornis. And some of them may well have taken refuge, like the kiwi, in nocturnal habits. Nocturnal moas, living in forests, would have a good chance of eluding all our searches.

The most encouraging tangible evidence is a discovery made by Dr R. A. Falla in 1949. In a Maori fowler's shelter in a confined valley west of Lake Te Anau in the extreme south-west of South Island, he found the broken and dismembered skeleton of a single *Megalapteryx*. There were also unfaded feathers of *wekas*, *kakapos* and *takahes*, preserved flax sandals and *weka* snares, which could not have been more than two hundred years old, and may have been less than a hundred.

In 1950 an expedition of New Zealand and American scientists went into the almost impenetrable forests around the fiords in the south-west of South Island. There were reports that they had found some more evidence that small moas had lived more recently than is generally admitted. There was never any official announcement to this effect. Perhaps this was due to the reserve—or caginess bordering on timidity—of zoologists nowadays; perhaps, too, they did not want to advertise this thread of evidence until they had followed it up on another expedition. There is still one honour to be won—to be the first to capture a living moa.

That New Zealand can still hide an unknown animal of fair size is strikingly proved by the story of another odd bird, the *takahe*. It is a good story, but I have not room here for more than a brief summary. The reader will find more details in Willy Ley's *Dragons in Amber*.

When the moa-hunt first began in North Island, the Maoris often mentioned another bird, the *moho* that they had formerly eaten, but it had now vanished. It was as big as a goose, and it could not fly although it had wings and feathers that looked like real feathers. But in all the harvest of moa bones there was none of the less interesting *moho*, and the bird was shelved with other Maori myths until 1847, when Walter

Mantell obtained near Waingongoro in North Island a sub-fossil skull and several bones which seemed to have come from a very fat rail. The bird had a breast-bone and could not therefore have been a kiwi or a moa. He sent them to his famous father, the geologist, in London, saying that they must have come from the bird known as *moho* in North Island and *takahe* in South Island. Owen confirmed the truth of the native reports and gave the bird the name of *Notornis mantelli*.

In 1849 sealers pitched their camp on Resolution Island, one of the largest islets at the jagged south-west tip of South Island. Their dogs led them on the trail of a large bird in the snow until they saw it furiously screaming and flapping in a dog's jaws. Its plumage was beautifully coloured with dark blue and violet on the head and neck, olive spotted with brighter green on the back and wings, metallic blue on the primaries and rectrices (the largest feathers of the wing and tail), purplish-blue on the chest and sides, and white under the rump. The thick beak and solid legs and feet were brilliant red.

66. The *takahe* of South Island, New Zealand.

The sealers naturally put the bird in the pot, but they kept the skin in the hope of getting some money for it. By an extraordinary stroke of luck it was bought by Walter Mantell, who was able to let them know in London that the bird that had vanished from North Island still lived on the South. In 1850 a Maori caught a second *takahe* on Secretary Island, not far away from the first. It was also obtained by Mantell, who sent its feathered skin home to join the other in the Natural History Museum.

Then the bird vanished for thirty years. When von Hochstetter landed in New Zealand in 1858 he tried hard to come by a *takahe* but on his return to Europe he was obliged to write:

> The specimen of *Notornis Mantelli* caught by seal-hunters in 1850 on Dusky Bay, South Island, and preserved in the British Museum, London, has, as far as I know, hitherto remained unique; and it appears to me, that this family of birds is now totally extinct.

No one had any luck, although a Maori of the fiords said that the bird was not at all rare on the shores of Lake Te Anau. In 1861–2 a Dr

Hector found *takahe* tracks near Thompson Sound and by the central part of Lake Te Anau; in 1866 a botanist called Gibson actually saw one in tall marsh grass near Motupipi; and in the same year the Maoris who told Sir George Grey about hunting small moas insisted that the *takahe* was very common. But nothing happened. Scientists in Europe grew tired of waiting and wrote it off as extinct.

And extinct it would have remained had not a dog come to the rescue again. This dog was out rabbiting in the Province of Otago near the fiords in December 1879 and brought back a *takahe* still breathing to its master, who dispatched the bird and hung it from the ridge-pole of his tent, intending to eat it. Fortunately the Station Manager, Connor, happened to pass the next day, and recognised it. He carefully prepared the skin and skeleton of this rarest of birds and sent it to London. There it was sold by auction and bought by the Dresden Museum—to the dismay of the curators of the British Museum, who had told their man "to bid as much as 100 pounds sterling for it." The Germans had bought it for £105.

A detailed examination of the first complete skeleton of a *takahe* at Dresden showed that it differed noticeably from that of the *moho* found at Waingongoro. The new species was called *Notornis hochstetteri* as a consolation prize for the scientist who had searched so hard to find it, and with so little luck.

Then the *takahe* played hide and seek for another 20 years. Nothing was found except an incomplete skeleton in 1884 and a complete one in 1892—both near Lake Te Anau. They knew where to look, but the best-organised hunts still yielded nothing. The country was marshy and covered with thick bush, where a bird could easily hide and a man could hardly go.

The next live *takahe*, in 1898, was once again caught by a dog, whose master, a Mr Ross, recognised the bird and preserved it entire—viscera and all. This specimen, the only one in the world, was sold for £250 to the New Zealand Government, who offered it to the Dunedin Museum.

Then half a century went by without a sign of the *takahe* (whose name means "the wandering one" or "the one that wanders at large"). It seemed to the world of science as if Mr Ross's specimen really was the last *Notornis*. There were, it is true, still vague rumours about footprints in the snow and reports from old Maoris who said that the birds lived in the mountains and only rarely came down near the lakes. But these tales were of just the sort that most zoologists obstinately refuse to

notice. This book is full of animals known only from their footprints and from native legends: evidence that is always greeted with amused disbelief. The story of the *takahe* shows how exaggerated and unjustified this scepticism is. Every time that this bird managed to avoid its hunters—and their dogs—for a decade the authorities decided that it must be extinct.

By 1947, just a century after Walter Mantell had proved the existence —or former existence—of *Notornis*, only four living specimens of the bird had been found and there seemed little hope of seeing a *takahe* again. But Geoffrey Orbell, a doctor at Invercargill, was undaunted, and optimistically set off with several companions into the thick forests on the eastern shore of Lake Te Anau. Three thousand feet up in the mountains he was surprised to find a small lake which scouts had told him of, although it did not appear on any map. This lake was well known in Maori tradition as *Kohaka-takahea*—"the nesting-place of the wandering one." If one could still discover a whole new lake in this country, surely there was hope of finding something so inconspicuous as a bird that could not fly? They had no such luck. They heard unusual bird-cries and found fresh footprints that might have been made by their quarry. But no *takahe*. Dr Orbell was not discouraged. He returned to the place in November 1948, loaded with cameras and cinécameras. His optimism was rewarded. Two *takahes* were caught in a single snare. They were tethered by one leg, photographed from every possible angle, and then released.

A year later Dr Orbell's third expedition was able to establish several facts about the *takahe*'s habits. It was purely vegetarian, it built its nest level with the ground, and seemed to have only one young one—which was quite black—a year. A dozen adults were seen. The population of two colonies in neighbouring valleys was estimated at between 50 and 100.

If it had not been for dogs, which could find the birds when they were invisible in high forest and scrub, we should probably still be unaware of the *takahe*. There is therefore all the more reason to think that the *moa* may survive. And Dr Orbell, encouraged by his success, has set about trying to capture a living *Megalapteryx*. The sceptics will object that the *takahe* never vanished for very long, but that the moa has been lost for a century or two. The recent resurrection of the *cahow* should answer this objection.

Until lately it was universally thought that the Bermuda petrel (*Pterodroma cahow*) had disappeared between 1609 and 1621, exterminated by settlers hungry for its flesh and eggs. The annals of the period report that some pioneers sent to Cooper Island, at the eastern end of the Bermudas, stuffed themselves with *cahows* until they died of indigestion. This orgy, which the famine in the Bermudas helps to explain, was equally fatal for the poor birds, who seemed to have been exterminated.

67. The *cahow*, or Bermuda petrel.

But in 1951 a team of American naturalists working with Dr Robert Cushman Murphy, Curator of Oceanic Birds in the American Museum of Natural History, were staggered to come upon *cahow* nests, apparently in use, on the cliffs of small islands off Castle Harbour. Five live birds were caught in running nooses on the end of bamboos, examined, ringed and released. Seventeen nests were counted in the crevices of the cliff, which showed that the population did not consist only of the few individuals that had been seen.

The Bermuda petrel had been thought to be extinct for more than three centuries, and it is a flying bird, far more conspicuous and visible than any flightless bird, however large. Today it is resurrected, and one day the moa may well be resurrected too.

CHAPTER ELEVEN

Waitoreke, the Impossible New Zealand Mammal

> If Cleopatra's nose had been shorter, it would have changed the face of the world.
>
> PASCAL.

PASCAL was exaggerating, of course, but his hyperbole would have been literally true of those much less conspicuous organs, the *waitoreke*'s teats. This animal, which has such cataclysmic implications, is a shy and ordinary-looking little beast. But it seems to be a mammal, and it is reported in New Zealand, the only country in the world, apart from small islands, that contains no indigenous mammals. There is geological evidence that New Zealand was joined to Australia only until the Jurassic period, when reptiles still ruled the world, and was cut off before the marsupial invasion in the middle of the following period; and there is the argument that not a single species of indigenous mammal has been found in New Zealand. If it should turn out that a hitherto undiscovered animal with teats inhabits that country, palaeogeographical reconstructions would have to be completely revised and the date of submergence of certain continental bridges would have to be changed by several tens of millions of years. For the *waitoreke* to reach New Zealand dryshod, the sea would have to have parted, as the Red Sea did for Moses, and closed again behind it in time to stop the advancing marsupials. Thus the face of the world at the beginning of the Cretaceous period literally depends on whether the *waitoreke* was a mammal. But was it? The creature is certainly supposed to have fur—but in this part of the world even birds, like the kiwi and moa, look as if they are covered with hair.

Such a puzzling creature with such revolutionary implications might be expected to arouse the constant and active curiosity of zoologists.

Actually most specialists have never even heard its name, and those who have find it simpler to ignore the problems that it implies by denying its existence out of hand. Nevertheless the *waitoreke* has good credentials.

In about 1850 Walter Mantell first heard of a mammal which he called *kaureke*. He was the son of a famous scientist and was a responsible man, destined to take an important part in New Zealand politics —not one to spread tall stories. When he was camping at Arowhena, not far from the present-day coastal town of Timaru on South Island, the Maoris told him that the *kaureke* was found some 10 miles inland. It was a very rare animal, they said, and because of its nocturnal habits there was little chance of seeing it. But its fur was very light in colour, almost white, and they said they had several times had a glimpse of it at its drinking-places. Mantell at once offered a large reward. The Maoris set off into the heart of the country, but eventually came back empty-handed. They would not have hunted so hard for a mythical animal. Their good faith was plain enough, Mantell told his father, adding that the beast might be extinct, but if so it had only died out recently. A few years later much more was heard of the creature, and the information was far more detailed.

In his great work on New Zealand, first published in 1863, Ferdinand von Hochstetter is quite explicit:

> From certain terms occurring in the Maori language, and from the most recent observations we may infer beyond a doubt, that New Zealand still harbours some few sporadic mammalia, which have thus far escaped the searching eye of science. . . .

After reviewing the Maori names for the various mammals (*pekapeka* the bat, *kiore* the little native rat and *kararehe* the native dog), which could all have reached New Zealand after it was cut off, he remarks:

> Besides these names we find the name Waitoreke, which has been only lately clearly defined, having been hitherto applied sometimes to an otter-like, and sometimes to a seal-like animal. According to the reports of Dr. J. Haast, the existence of this animal has been recently established beyond a doubt; it lives in the rivers and lakes in the mountain ranges of the South Island, is of the size of a large cony with a glossy brown fur, and is probably to be classed with the otters.

This information was based on a letter of 6 June 1861 from Dr Julius Haast, who wrote:

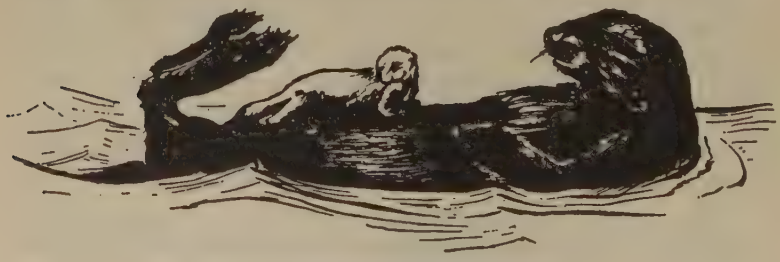
> At a height of 3500 feet above the level of the sea I frequently saw its tracks on the upper Ashburton River (Prov. Canterbury, South Island), in a region never before trodden by man. They resemble the tracks of

> our European otter,—only a little smaller. The animal itself, however, was likewise seen by two gentlemen, who have a sheep-station at Lake Heron not far from the Ashburton, 2100 feet high. They describe the animal as dark-brown, of the size of a stout cony. On being struck at with the whip, it uttered a shrill, yelping sound, and quickly disappeared in the water amid the sea-grass.

There is so little likeness between the *kaureke* (whitish and seen at its drinking-places) and the *waitoreke* (dark brown and aquatic) that one may well wonder whether they are not two different animals, or the first a distorted hearsay version of the second. Certainly we have more information about the second, which has been reported by white witnesses, so let us concentrate upon it for the moment. As far as I know nobody has met either animal since.

The description of the *waitoreke*, vague though it is, reminds me of three separate creatures. First one thinks of the Australian *bunyip* which is sometimes described as a seal, sometimes as an otter. But the *bunyip* is too problematical to be used to explain another problem. Then, like von Hochstetter, one is reminded of an otter—yet how could a placentary mammal like an otter have reached New Zealand when Australia, the previous stage in the colonisation of Oceania, contains nothing but marsupials? If it is a true otter it could have come by sea, for there is a purely maritime species: the sea-otter (*Enhydra lutris*). It sleeps in the open sea, floating on its back, in which position it usually swims. It does not even land—as the seals do—in the breeding season. It mates and gives birth in the sea. When its young are too small to swim under their own steam it carries them on its belly.

This large animal is much hunted for its fur and has consequently become much rarer. Now it is said to be found only around the Aleutians and other North Pacific Islands; but in 1938 a pack of 400 were seen swimming down the Californian coast, and the Marquis de Chatteleux, that indefatigable globe-trotter who signs his travel-books



68. Sea-otter carrying its young.

"Stany," says he has seen large numbers along the coast of southern Chile, which seems to imply an extraordinarily long migration.

If this was possible on the east of the Pacific, it could also have happened on the west, and the sea-otter could thus have reached New Zealand. It would have been a more hazardous voyage, for after visiting all the archipelagos between the Kuriles and the New Hebrides—Japan,[1] the Philippines and New Guinea—the sea-otter would have had to cross a wide stretch of sea without a single landmark on the way. It could, of course, have been driven there involuntarily by the Equatorial Current from the New Hebrides, that washes the east coast of Australia, turns a half-circle and warms the west coast of New Zealand. Once the sea-otter had reached New Zealand waters it could not have returned against the current, and could easily have given up its migratory habits and made its way up the rivers to live like its ancestors in fresh water. All this is pure hypothesis—but only a hypothesis can explain the *waitoreke*.

Perhaps it might be some kind of platypus. The Australian animal is very like an otter, and it would not have so far to come as the sea-otter. To find it—or a relative—in New Zealand would fit in with the family tree of the mammals and the geography of past ages.

It is wrong to try—as many authors do—to derive each group of mammals by direct descent from another. The monotremes, marsupials and placentals should be considered as three separate and successive attempts with varying success at a type of vertebrate with a constant temperature and able to suckle its young.

> The marsupials have often been considered to be the ancestors of the placentals [writes Jean Piveteau, Professor of Palaeontology at the Sorbonne]. An anatomical study free of all preconceived ideas shows that they are nothing of the kind. These two great subdivisions of mammals developed independently of one another, while still remaining closely parallel in their adaptations.

At first sight the oviparous monotremes, which have many reptilian features, look as if they derive from the reptiles, rather than from the amphibians, the probable ancestors of the other mammals. But a study of their brain, heart and diaphragm shows that they are indeed true mammals, but have diverged very early from the original stock and become very specialised along peculiar lines.

Be that as it may, the three groups of mammals certainly grew and

[1] Sea-otters were found in Hokkaido until they were exterminated in the Western Pacific by fur-traders in the nineteenth century.

expanded at quite different periods—as is usual with rival types. There is not the least doubt that the marsupials spread and flourished before the placentals. But practically nothing is known of the monotremes' ancestors. The most one can say is that there was a great crop of reptilian mammals (or mammalian reptiles) in the Jurassic period, and that the monotremes were probably among them. During the Age of Reptiles they could have spread across the world from Asia to Australia and thence to New Zealand, which were then all connected, without being noticed much, although the reptile empire would still have been able to crush any rising of true mammals. If there *is* an indigenous mammal in New Zealand which has been there ever since the islands were cut off, there is a good chance that it is a monotreme. And as it is supposed to look like an otter—that is to say like a platypus—the most likely theory is that it is one of this creature's close relatives. The distribution of the three groups of mammals would then fit in perfectly with the geological

69. Platypus swimming (after Hartwig, 1910).

changes of the past. The main expansion of the monotremes would have been in the Jurassic period. Then in the middle of the Cretaceous the rising tide of marsupials swept them off the earth except for a few rare species in Australia and New Guinea, and one, the *waitoreke*, which escaped when New Zealand was cut off. Finally the placentals, at the end of the Cretaceous and beginning of the Eocene periods ousted all the marsupials but a few in South and Central America and the Southern States of the U.S.A., from everywhere except the now isolated countries of New Guinea and Australia.

If, despite all this theorising, it should turn out that the *waitoreke* is neither a sea-otter nor a monotreme, it must have been introduced by the Maoris when they came to New Zealand. But while it is easy to see how they carried dogs on purpose and rats by accident it is hard to understand how they could have brought this strange animal, let it run wild and then forgotten that they had done so. If the *waitoreke* is not a myth it is certainly the devil of a puzzle.

Part Four

RIDDLES OF THE GREEN CONTINENT

"Now, down here in the Matto Grosso"—he swept his cigar over a part of the map—"or up in this corner where three countries meet, nothin' would surprise . . ."

SIR ARTHUR CONAN DOYLE, *The Lost World.*

NORTH
ATLANTIC
OCEAN
Sierra de Perijá
Catatumbo
Caracas
Maracaibo
Orinoco
VENEZUELA
R. Essequibo
R. Demerara
R. Berbice
Bogotá
Uvá
Gran Sabana
COLOMBIA
GUIANA
Guaviare
R. Negro
R. Amazon
Quito
Putumayo
EQUADOR
Iquitos
Manaos
Obidos
Belem
Alemquer
Purus
BRAZIL
Abunan
Villa Bela
Mirim
Guajara
Madeira
Matto Grosso
Aragnaya
Salvador
PERU
Lima
Guaporé
Goyaz
BOLIVIA
Paraguay
PACIFIC OCEAN
Pilcomayo
Parana
Sao Paulo
S.Paulo
Rio de Janeiro
PARAGUAY
Asuncion
Iguassu
Curitibanos
Utajahy
Sta Catarina
Lage
Salado
Uruguay
Parana
Cordoba
Arapehy
Concordia
URUGUAY
Santiago
Mercedes
Montevideo
Buenos Aires
R. de la Plata
SOUTH
ATLANTIC
OCEAN
Bahia Blanca
Negro
L. Nahuel Huapi
Chubut
L. Colhuapi
L. Buenos Aires
Santa Cruz
R. Santa Cruz
R. Gallegos
Last Hope Inlet
Magellan Str.
Tierra del Fuego
Miles
0
500
1000
Tropical Forests

CHAPTER TWELVE

The Patagonian Giant Sloth

Only one fault he had, which cock-robins have likewise . . . that when any one else found a curious worm, he would hop round them, and peck them, and set up his tail, and bristle up his feathers, just as a cock-robin would; and declare that he found the worm first; and that it was his worm: and, if not, that then it was not a worm at all.

CHARLES KINGSLEY, *The Water-Babies.*

THE conquistadors who first discovered Central and South America must have been disappointed to find that although the fauna was so rich and new, there were no monsters. From the beginning, naturalists have seen the so-called neo-tropical zone, which stretches from Mexico and the West Indies to the very tip of South America, as a region of small animals. The llama, the tallest of its quadrupeds, is merely a rather thin, humpless small camel, a dwarf compared to a giraffe. The deer are small and have small horns, the tiny pudu standing only 14½ inches at the shoulder. The tapir, the most massive of the indigenous mammals, is far from the size of its distant African cousins the elephant and the rhinoceros. The peccary is merely a miniature wild boar. The jaguar and the puma or cougar are smaller than the lion and tiger. There is only one bear, the spectacled bear (*Tremarctos ornatus*), which lives in the Equatorial Andes of Bolivia and Chile, and it is small in height and bulk. None of the monkeys is as big as a gorilla or orang-utan. And the pygmy marmoset (*Cebuella pygmaea*) is so small that you can hold it all in the palm of your hand.

Among the birds the phenomenon is less obvious, for South America can boast one of the largest living flying birds: the condor of the Andes (*Vultur gryphus*), which disputes the title with the wandering albatross, is 4 feet long and its wing-span may exceed 10 feet. But the rhea, the largest South American running bird, is at least a third smaller

than an ostrich, and the most typical neo-tropical birds are the family of humming-birds (Trochilidae) which are found only in America.

On the other hand, the orders of mammals that are usually small are relative giants in Central and South America. All the largest rodents are found there—the subungulates as they are called, the paca, agouti and the capybara, a sort of huge guinea-pig 3 feet long with webbed toes and weighing as much as 150 pounds. Among the insectivores there is the very rare almiqui (*Solenodon paradoxus*) of Cuba and Haiti which looks like a shrew with big ears but is as large as a rabbit. Its tail alone is 8 inches long. And there are giants among almost all the groups of smaller animals, particularly the insects. Some South American Lepidoptera—the Atlas moth (*Coscinocera hercules*), for instance—have a wing span of over 13 inches. There are wasps and ants (the terrible *tucandera*, for example) which are the size of mice; and the largest of the spiders, a tarantula (*Gramostola*), is 10½ inches across (the body alone is 3½ inches across) and is not afraid to attack chickens and snakes and sometimes even succeeds in bleeding a rabbit to death.

There is, however, one group of mammals in the neo-tropical zone which cannot be compared with those in other zones, for they are peculiar to it: the Xenarthra, consisting of the anteaters, sloths and armadillos.[1] These creatures, which are odd in more than one respect, vary considerably in size. The giant anteater (*Myrmecophaga jubata*) is sometimes nearly 8 feet long—thanks to its enormous plume of a tail which is as long as the rest of its body. The pygmy anteater (*Cyclopes didactylus*) is hardly as big as a squirrel. The armadillos range from the giant armadillo (*Priodontes gigas*), 5 feet long, to the *pichiciago* (*Chlamyphorus truncatus*), a mere 6 inches. The sloths, the most phlegmatic of mammals, are never larger than a young chimpanzee.

As a general rule the animals in the neo-tropical zone are fairly small. So, even though much of South America is still unexplored, one is not inclined *a priori* to put much credit in certain legends there about quite enormous beasts.

In Patagonia travellers have collected from the Tehuelche Indians[2]

[1] The creatures of the Old World, which are occasionally called "anteaters," belong to different zoological orders. They were originally included in the order of Edentata with the anteaters, sloths and armadillos, but now the aardvarks are included in the ungulates, and the pangolins form an order of their own, the Pholidota.

[2] These are the tall Indians (5 feet 6 inches to 5 feet 11 inches) whom Magellan called *Patagons* (Spanish for "big feet") because they wore shoes of llama's fur. *Tehuelche* is the name given to these pampas Indians by their mountain neighbours, the Araucans. They call themselves *Tzoneka*.

70. Giant anteater.

a description, very vague it must be admitted, of a large nocturnal animal, of which no trace can be found among the living fauna of the continent.

It is a large heavy beast, as big as an ox but with shorter legs and covered with thick short coarse hair. Its appearance is very frightening. It is armed with enormous hooked claws, just like an anteater's, with which it digs a huge burrow, where it sleeps all day: that is why it is hardly ever seen. According to some versions its habits are amphibious. There is some doubt whether it is savage or not, but all agree that it cannot be harmed by arrows or bullets, and oddly enough, this last fabulous-looking characteristic is the best evidence that the monster is not a fable.

The *a priori* reasons for discounting such tales are somewhat weakened when one learns that South America was not always inhabited only by relatively small mammals. The first irrefutable proof of this was established in 1789, when gigantic bones which seemed to belong to an animal almost as large as an elephant were found in mud on the banks of the Rio Luyan not far from Buenos Aires. The peons were the only people not to be surprised at this discovery: it was a giant mole, they said, which died whenever it had the misfortune to be exposed to sunlight.[1] This naïve explanation satisfied no one else, so the Marquis of Loreto, then Viceroy of the colony, had the bones sent to King Charles IV of Spain, who presented them to the Royal Museum of Madrid, where they were entrusted to José Garriga. This naturalist at once set

[1] Curiously enough we shall find the same legend in Siberia and China where it refers to the carcases of frozen mammoths which have appeared in thawing glaciers. See page 332.

about preparing, assembling and mounting the skeleton so that he could make a detailed description. The results of his slow and painstaking work were published in 1796, to the great excitement of the entire scientific world. Goethe wrote an essay on the monster in which some have seen the beginnings of a theory of evolution.

Meanwhile a French diplomat had visited the Spanish scientist and had taken to the Paris Museum five remarkable engravings of this skeleton which Juan-Bautista Bru had made to illustrate the preliminary description of the fossil. A young naturalist called Georges Cuvier, who was just beginning to be talked about, saw another opportunity here to add to his reputation. The future "Father of Palaeontology," who had a certain skill in comparative anatomy and even more temerity, set about placing the monster in its zoological classification on the mere evidence of these drawings. This was not unusual for him.

> He used to talk about all kinds of sciences [wrote de Blainville], and to write about all parts of them so interestingly, without even having studied them; for this it was enough to have had a conversation with the specialists or to have read some of the notes that they had written, and he had the art of connecting and linking everything together making it so wonderfully interesting that one would have thought that he understood the subject thoroughly.

This facility coupled with ambition and utter lack of humility led him to make several memorable bloomers—which he always knew how to cover up—but this time he was in the right and added considerably to his fame.

In a communication to the Académie des Sciences he gave the name of *Megatherium* ("large mammal") to the animal which he recognised as a sort of "giant sloth."

> Its teeth [he wrote] prove that it lived on vegetables, and its sturdy forefeet, armed with cutting claws, lead us to believe that it was principally their roots that it attacked. Its size and its foreclaws would have provided sufficient means of defence. It could not run fast, but it was not necessary for it to do so, as it had no need either to pursue or to flee . . .

Cuvier was convinced his contemporaries had a complete knowledge of all the large animals that recently inhabited the earth; the monster *must* therefore have perished, and, what is more, perished during a general cataclysm before man spread over the whole earth. So he concluded somewhat airily:

ne Megatherium's sest living relatives: e two-toed sloth, or au (*above*), and the ree-toed sloth, or ai (*right*).

The armadillos a
even more heav
armoured than th
distant cousin t
Mylodon.

It would be very hard to find the causes of its destruction in its structure alone; but if it still existed, where could it have hidden from all the searches of hunters and naturalists?

Its similarities relate it to several kinds of edentates. It has the head and shoulders of the sloths. The legs and feet provide a strange mixture of characteristics belonging to the anteaters and the armadillos.

We can now see that there is nothing monstrous in this mixture, since all the ingredients come from very closely related animals. But everyone was surprised at the size of this South American animal. When it stood on its hind-legs it was about 15 feet high.

Unlike present-day sloths, it could not have lived in trees. From all

71. Reconstruction of the Megatherium.

that we now know about it, it seems to have been a sort of huge and hairy bear, armed with terrible claws like so many sickles. It must have usually stood upon its hind-legs. Its heavy and powerful tail, the structure of its pelvis and hind-legs forming an enormous supporting base, the type of articulation of its vertebrae, all show a clear tendency to an upright posture. Subsequently, at Carson City in Nevada, huge footprints, 18 inches long by 8 inches wide, were found to confirm this theory.[1] If the creature sometimes put its fore-feet on the ground (like

[1] These footprints, imprinted in hard rock, were discovered in a prison yard. For a long time they were taken for a giant's because of their human appearance. Mark Twain wrote a humorous article about them in which they were the result of a memorable binge.

the kangaroo when it walks without jumping), it must have been so lightly that the heavy hind-feet at once obliterated all trace of them.

The Megatherium's great height enabled it to feed on the foliage of trees, hooking its claws firmly on to their branches so that it could browse lazily with the least effort. With its powerful claws it must even have been able to uproot taller trees so that it could graze on their leaves. Certainly it was strong enough to do so, but if it was as indolent as its little nephews the ai and the unau, it might well have scorned the effort.

Naturalists were so impressed by the size and strangeness of this creature that at the end of the eighteenth century and for most of the nineteenth they did not dream that it could possibly have survived until our time. In Europe the large animals, like the ancient elephant, the mammoth and the rhinoceros, had been extinct since a geological era which according to Cuvier's Theory of Revolutions of the Globe had preceded our own. On this analogy the Megatherium was thought to have perished in the Tertiary era. Man could never have known this monster of a past age.

This did not prevent King Charles IV from being so struck by the description of the animal that he at once ordered the officials of his transatlantic colony to send him one dead or alive. Several generations of scientists laughed at the King's folly. But since then much evidence has shown that the King was nearer to the truth than the scientists. Today no zoologist dare swear that it was impossible to grant at least part of the King's wish and send him the body not of an actual Megatherium, but of a relative almost as large. For the Megatherium is not the only giant in the group of sloths, which collectively are known as gravigrades. In pampean and even in post-pampean deposits they were represented by a whole series of giants, among which were the Mylodons (*Mylodon*, *Glossotherium*, *Grypotherium*) which were very like the Megatherium, except that they were about the size of an ox and had much longer tails.

The Tehuelche Indians' legend seems much less absurd than it did at first. But other evidence was soon to give it a peculiar weight. Little by little as the years went by it became evident that the giant gravigrades, though huge and fantastic, were not such old fossils as the extinct pachyderms in Europe. And scientists eventually had to admit that the mammoth and the rhinoceros had been contemporary with man during the Quaternary era, when pictures of them were found in caves.

Given the clearly recent date of the pampean deposits, to say nothing of the post-pampean, in which the remains of the Megatherium and other no less impressive creatures were found, they could only date from the very latest geological period, either the Upper Pleistocene or even the present period, the Holocene. That is to say they lived less than 30,000 years ago. But as it was almost universally believed that man did not invade America, by way of the Bering Strait, until quite recently—between 2,000 and 20,000 years ago according to various estimates (and in the nineteenth century scientists inclined to the shorter period [1])—no one thought at first that human beings could have known these monsters. And no prehistorian had ever been able to show the smallest drawing of the giant edentates comparable to the French cave-paintings of mammoths and reindeer.

In 1870, however, the first evidence was found that man in South America had been contemporary with some of the vanished gravigrades. In a terrace of the little valley of the Rio Frias near Mercedes the famous Argentine palaeontologist Florentino Ameghino discovered some very decomposed human bones, and with them were some cut stones, charcoal and some animal bones that had been pierced or incised, the remains of another huge monster: the Glyptodon (see illustration on page 303). This was not a giant sloth but a giant armadillo that had evolved a rigid carapace like a tortoise's shell, which alone was sometimes as much as 12 feet long. Everything outside this armoured dome was covered with plates, and in one of them (*Doedicurus*) the massive tail ended in a spiny ball like a mediaeval mace. It was a living tank.

In 1881, near the Rio Arrecifer, Professor Santiago Roth found in deposits at Fontezuelas an almost complete human skeleton curled up under, or at least very near to, a Glyptodon's carapace. Further similar finds—carapaces that had been tipped up or turned over by man; worked flints and traces of hearths under these animal cupolas—soon showed that the first South Americans used Glyptodon carapaces either as houses or as tombs.

I need hardly say that these discoveries, which flatly contradicted the accepted theories of the day, were bitterly disputed. Anthropologists refused to believe that man could have come to America as *early* as the date when giant edentates were supposed to have lived. Palaeontologists

[1] From recent archaeological discoveries and the method of dating organic remains absolutely by measuring the radio-active Carbon 14 in them, it now seems certain that the oldest human remains in America date from the end of the Pleistocene. "This would be 10,000 or 12,000 years ago, or 15,000 at the very most."—Boule and Vallois, *Les Hommes Fossiles*, 4th ed., 1952.

denied that these creatures could have survived so *late* as man's arrival in the continent. Both proved to be wrong.

It could no longer be pretended—somewhat disingenuously—that recent Indians had merely been using fossil carapaces, when the charred bones of gravigrades were dug up and found to bear marks of crude implements; it was clear that after cutting off the meat the Indians had split the bones to get at the marrow. And one day a giant sloth's skeleton was found at the bottom of what had once been a pit in a position which made it possible to reconstruct exactly how it had died. The four legs were still complete, but all the middle of the body had been more or less destroyed and had been replaced by charcoal and ashes. Obviously the sloth had been trapped in the pit, and as they were unable to get it out the Indians had roasted it *in situ* by lighting a fire under its belly.

There was now no doubt that the Megatherium had lived at the same time as man. But for how long had it continued to do so? Man's first migrations in Alaska, according to the most exact estimates, seem to have happened about 12,000 years ago, around 10,000 B.C. But when did the first men reach the very tip of South America? Several thousand years later, no doubt—let us say 7,000 B.C.[1] Thus the first American Indians could equally well have caught giant edentates and eaten their flesh in historical times or several thousand years earlier. The date the monsters had become extinct was still very much in doubt—if they really were extinct. No one, it is true, has yet killed one or shown one in a zoo, but Patagonia is huge and little known, especially the almost fathomless *boscosa*, the forest region between the pampas and the Cordillera of the Andes. And there was still the Tehuelche legend.

Then, in 1898, someone brought Professor Florentino Ameghino, of the Buenos Aires Museum, a lot of little bones the size of beans from southern Patagonia and asked him what animal they could have come from. They had been extracted from a piece of leather $\frac{3}{4}$ inch thick and covered with long reddish-grey hairs in which they had been embedded like small cobbles in a road. This skin belonged without the slightest doubt to a large ground-sloth, and Ameghino was even able to determine its origin more exactly. It was already known from palaeonto-

[1] In the cave of Palli-Aike, near the Straits of Magellan, hearths have been found containing half-charred bones of horses, guanacos and Mylodons. Thanks to the Carbon 14 method Libby and Arnold have recently been able to fix their age exactly at 8,700 years.

logical discoveries that the Mylodon, the Pseudolestodon and the Glossotherium were protected all over with these little bones, which were contained in the skin and were presumably a stage on the way to the more highly developed ossification to be seen in the armadillos. Nothing of this kind had been noticed in the remains of the Megatherium, Lestodon or Scelidotherium. From the size and shape of the bony nodules, Professor Ameghino reckoned that they had come from the fresh remains of an animal similar to a Mylodon.

Ameghino was a bold and original man—reckless and too quick to leap to conclusions, his enemies often rightly said—and this was enough for him to publish in 1898 a first note upon "a living representative of the ancient fossil gravigrade edentates of the Argentine." He had a good

72. Asian pangolin.

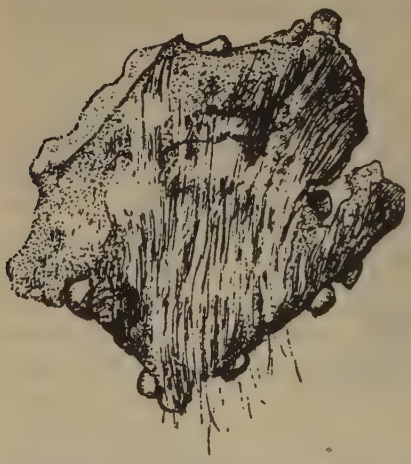
reason for being so positive. A friend of his called Ramon Lista, who was the Argentine Secretary of State and a well-known geographer and traveller, had seen a curiously similar animal with his own eyes several years before. During an expedition into the heart of the province of Santa Cruz, in southern Patagonia, Lista and his companions saw an odd quadruped resembling an Asian pangolin (*Manis*) both in shape and size, except that instead of being covered with scales it had long reddish-grey hairs. He was sure it was not a pangolin—an animal unknown in the New World—but thought it must be some sort of edentate closely related to one. They shot at the beast several times, but this did not seem to trouble it in the least, and it vanished into the bush apparently unharmed.

The Tehuelche had not lied. It is not surprising that a creature, armoured as some of the gravigrades are, could endure volleys of arrows

and even gunshot without injury. And the legend at once loses its aura of incredible fable.

> In spite of the authority of Lista [wrote Ameghino], who, besides being a learned traveller was also a skilled observer, I have always considered that he was mistaken, the victim of an illusion.

Now it really seemed it was not an illusion, and Ameghino concluded that the gravigrade from which his bony nodules had come was of the same species as that seen by his friend. It must be a close relation to the Mylodon, a long-tailed ground-sloth remarkably similar in outline to a pangolin. The Mylodon, while not so vast as the Megatherium, was by no means so small as the Indian pangolin, which is never more than 4 feet 3 inches in length, of which 1 foot 9 inches is tail alone. But as the Tehuelche spoke of a rather large animal, might not Lista have seen a young specimen? At all events the possible existence of a surviving ground-sloth of small size was of immense zoological interest, and in his original 1898 description, Ameghino never identified the mysterious creature with the Mylodon, which was as big as an ox.



73. Piece of Mylodon's hide, still bearing hair and small bones in the skin. (Palaeontology gallery of the Paris Museum)

At the moment when Ameghino came into possession of his sensational little bones, Lista had just been killed by the Tobas Indians while he was exploring the Pilcomayo region.[1] The Professor named this new little Mylodon *Neomylodon listai* in his honour.

Ameghino's note caused sensational headlines all over the world, and soon everyone was eager for more news of the mysterious creature. The first thing to be found was the piece of fresh hide which he had referred to—though not very explicitly. This did not take long, for similar pieces of skin had come into the hands of several scientists: the Swedish

[1] And not by political enemies as Willy Ley reports, presumably under the impression that this is the normal death of all South American politicians.

explorer, Dr Otto Nordenskjöld in 1896 and Dr Francisco P. Moreno, Director of the La Plata Museum in 1897.

These samples had both been cut from a piece of leather 5 feet long by about 2 feet 6 inches wide which had been casually hung from a tree to mark the boundary of an *estancia* belonging to a retired German captain called Eberhardt, who was farming at Shemenaiken near the Rio Gallegos close to the Straits of Magellan.

Some said the skin was a cow's, others a llama's—at all events the animal must have had a strange skin disease. No one was certain, not even Eberhardt, who had found the skin in January 1895 while he was exploring a cave with several companions. This cave, as vast as a cathedral, in which they also found a human skeleton in a little niche, lay on the shores of a fiord called Ultima Esperanza—Last Hope Inlet. One thing was certain, the skin, which was found buried in the ground, carefully rolled up inside out, had been prepared by human hands.

After it had been hung up it excited the curiosity of several visitors, who took the liberty of cutting off little pieces as souvenirs—a task which needed an axe or a saw because of the embedded bony nodules. Dr Otto Nordenskjöld visited Eberhardt in 1896 on his first expedition to Terra del Fuego and systematically excavated the Cueva Eberhardt and brought to light the horny sheath of a ground-sloth's enormous claw. He took his finds back to Sweden, where Einar Lönnberg published a description of them in 1899. This zoologist agreed with Ameghino about the animal the skin had come from: the bony nodules, and also the claw, showed that it was related to the Mylodon. But, from the size of the whole skin, the *Neomylodon* must be about the size of a small rhinoceros—which happened to be the size of one of the Mylodons whose remains were found in pampean deposits. He thought that the creature Lista had seen must have been a quite different animal. But this does not necessarily follow, since even a rhinoceros is no bigger than a calf at one stage of its existence. Finally he pronounced that the animal was certainly no longer extant:

> It is absolutely impossible to think that this animal, if it was still among living beings, could have eluded the sharp eyes of the native Indians. Even if it had exclusively nocturnal habits, and hid itself during the daytime in the most desolate places, the hunting Indians must have come across it now and then, and they must certainly have observed its tracks, its traces where it had broken off branches and twigs when feeding, its scratchings or diggings in the earth, its excrements, etc.

This opinion is all the more surprising since Ameghino had already noted the Tehuelches' tales about the animal. It is true that he had spoken rather vaguely and that it was only in his second note that he completed his inquiries on the subject.

Subsequent visitors to Eberhardt's *estancia*, most of them Chilean officers, carried off small pieces of the skin, and presumably it was one of these souvenirs that eventually found its way to Ameghino's desk. In 1897 Dr Francisco Moreno, of the La Plata Museum, excavated the Cueva Eberhardt with the geologist Rudolf Hauthal and Dr Émile Racovitza, who had been zoologist on the famous *Belgica* Expedition. An engineer called Luis A. Alvarez, who had been with Eberhardt when the cave was first discovered, acted as their guide. In the cave they found nothing but the remains of a large rodent (*Miolania*); but Alvarez had already taken them to Eberhardt's farm, where Moreno saw that all that was left of the giant sloth's skin was a scrap about 18 inches square. This was better than nothing. With Eberhardt's permission Moreno took it back to the Museum of La Plata in July 1898. Ameghino's bombshell burst a few months later.

Dr Moreno, who had to go to England at that time, took with him the square of skin, and on 17 January 1899 showed it to the members of the Zoological Society of London, who could hardly contain their excitement. Nevertheless he claimed not to be astonished by his examination of the skin, which was obviously fresh and had been cut off by human hands. For it had now been established that Mylodons were contemporary with man farther north in the Argentine. Moreover Moreno had himself found in a neighbouring cave another mummified body, also very well preserved, of a man of an extinct race quite unknown to the Tehuelche who now inhabited the area. He therefore maintained, with Professor Seeley's support, that the Mylodon's skin could have remained in an apparently fresh state untold ages, just like the moa's skin and feathers.[1]

The whole meeting disagreed with this view, and were sure that the skin belonged to a recently dead animal; it was still fairly supple, and one could see remains of muscles and ligaments and a "coating of dried serum was still preserved on the old cut edges," as Sir Arthur Smith

[1] As we have already seen, the moas, even if they were completely extinct, had not been so for more than a century, so this argument is worthless. G. E. H. Barrett-Hamilton was more to the point when he recalled, somewhat later, that very fresh remains of the Norway lemming (*Lemmus lemmus*) had been found in Portugal. Even in the Pleistocene period no traces of this rodent are found south of England.

Woodward who undertook the official description remarked. Sir Arthur "would, indeed have unhesitatingly pronounced the skin to belong to a recent animal killed quite lately, had not Dr Moreno been able to give so circumstantial an account of its discovery."

It was at this point that Professor Ameghino's second note appeared. After remarking that the Tehuelche name for the strange quadruped he had already mentioned was *iemisch*, or in Spanish *tigre de agua* (water-tiger), he said that he was now in a position to reveal more about this creature, thanks to the discoveries of his brother Carlos, who for two years had been constantly travelling in Patagonia collecting fossils and doing geological research. In the middle of the previous year, 1897, he had written to Ameghino as follows, sending him several little bones:

> I have at last obtained some valuable data about the famous *iemisch*, which is not a myth as we imagined but actually exists. I have seen in an Indian's hands a piece of the *iemisch*'s skin in which were embedded the little bones that I am sending you, similar to those we have found in a fossil state with Mylodons' skeletons. Moreover Hompen, another Tehuelche Indian, has told me that when he was going from Senguer to Santa Cruz he had met a *iemisch* on the road which had barred his way: he opened fire and shot it dead. According to the Indians the animal is amphibious and walks as easily on dry land as it swims in the water. Today it is confined to the centre of Patagonia, in caves and lairs on the banks of Lakes Colhué, Fontana, and Buenos Aires, and the Rivers Senguer, Aysen, Huemules etc. But according to tradition, it once spread north as far as the Rio Negro; and in the south, as old Indians recall, it used to live in all the lakes on the eastern slopes of the Andes, right down to the Straits of Magellan. Thus, around the middle of the century, a *iemisch*, which had come down from lakes in the Andes by the Rio Santa Cruz, landed on the northern bank of this river near Pavon island. The terrified Indians fled into the interior, and as the only reminder of its inopportune arrival gave the deserted place the name it still bears today: *Iemisch Aiken* (that is, "*iemisch*'s harbour or port of call"). This animal is of nocturnal habits, and it is said to be so strong that it can seize horses with its claws and drag them to the bottom of the water. According to the description I have been given, it has a short head, big canine teeth, and no external ears; its feet are short and plantigrade, with three toes on the fore-feet and four on the hind;[1] these toes are joined by a membrane for swimming, and are also armed with formidable claws. Its tail is long, flat, and prehensile. Its body is covered with short hair, coarse and stiff, of a uniform bay colour. Its size is said to be larger than a puma's, but its paws are shorter and its body thicker.

[1] Professor Ameghino later altered this to four fore-toes and three hind-toes, to agree with the anatomy of the Megatherium.

Professor Ameghino seems to have gone completely astray in accepting this theory of his brother's that the armoured skin came from the Patagonians' *iemisch*, which hardly agrees with one's idea of a ground-sloth like a Mylodon. A monster of this kind might have been rather frightening because of its enormous size and impressive claws, but it is too much to believe that this undoubted vegetarian seized horses and drowned them. It is especially suspicious that a vegetarian should have canine teeth, or indeed that an edentate should have ordinary teeth that looked like canines. The *iemisch*'s alleged amphibious habits—which its webbed feet confirm—are a long way from the traditional picture of the Mylodon, not that a creature's habits are necessarily certain from its skeleton. Several large vegetarians, like the tapir and hippopotamus, lead an amphibious life, although nothing in their skeletons betrays the fact. It would be very strange for a water animal to have huge burrowing claws—but it would not be the first paradoxical feature in an animal. More information about the Mylodon's habits was needed.

Meanwhile several more scientific expeditions had been to the Cueva Eberhardt.

The first consisted of Swedish scientists, led by Erland Nordenskjöld, cousin of the Otto already mentioned, who excavated the cave and brought back a large quantity of the little bones mixed with dung and finely chopped hay which constituted the soil in the place where the skin had been found. After a very thorough comparative study Nordenskjöld remarked that the little bones and the skin itself could be attributed to a known Mylodon, *Glossotherium darwini*, whose fossil remains had been found in pampean deposits and described by Sir Richard Owen. Assuming, for lack of information to the contrary, that Ameghino's bones had come from the Cueva Eberhardt, his name of *Neomylodon listai* was a needless synonym for *Glossotherium darwini*. This was a blow to the professor, who had a passion for naming animals, and had baptised such astronomical numbers, especially of fossils, sometimes hastily and often mistakenly, that many palaeontologists refused to accept his names for them. I am not surprised that after Nordenskjöld's statement he should have hastened to publish his second note to prove that his bones had not come from the Cueva Eberhardt; and I should point out that whereas in his original note he said that he had received them from someone who asked him what animal they could have come from, in the second note his brother tells him what animal *he* thinks they came from.

This suspect behaviour does not mean that Ramon Lista did not see his mysterious animal, or that the Eberhardt skin was not strangely fresh. Albert Gaudry, the famous French palaeontologist who went to Sweden to examine all the evidence brought back by the Nordenskjölds, wrote:

> The pieces of skin which M. Lönnberg showed me at Uppsala with their hairs still firmly attached, a bone with dried muscles still clinging to it, bones which do not stick to the tongue, as I saw for myself, droppings, finely chopped hay in a fresh state, and several horny parts of claws intact, are inexplicable unless the *Neomylodon* took refuge in the Cueva Eberhardt at a fairly recent date. There are no reasons for doubting M. Ameghino's belief that one might find it alive.

74. Plan of the chamber in the Cueva Eberhardt, where the two rolled-up mylodon skins (*a* and *b*) were found. *E*: narrow entrance left at the side of a rough boulder wall. *S*: niche containing human skeleton. *T*: raised platform. *M*: small mound. *p*: chopped hay. *l* (dotted line): line where ashes and layer of dung meet. *m*: mussel-shells (after R. Hauthal).

After the Swedes an Argentine expedition under the geologist Rudolf Hauthal, Dr Moreno's assistant, set out in April 1899 and put the contents of the cave of Ultima Esperanza through a fine sieve. It turned out that Eberhardt's skin had not been found in the entrance of the cave, but in an inner chamber, where the human skeleton had also been found. A crude wall of boulders closed the entrance except for a narrow lateral passage. Some 50 yards inside the chamber a second and very thick wall barred the way and formed a raised platform. In the middle of this part of the chamber rose a little artificial mound. The ground was covered with a layer of dust and pebbles varying between 1 and 3 feet in depth, in which were found obvious remains of a kitchen: mussel-shells and charred pieces

of guanaco and deer bones. Under this superficial layer, near the platform, they came upon a great mass of excrement belonging to some herbivorous animal: part of it had been burnt and reduced to ashes. Nearer the central mound they dug up a heap of dry hay in a good state of preservation. In this lower layer of dung, fodder and rubbish they found numerous broken bones of the so-called *Neomylodon* (alias *Glossotherium*), as well as remains of a fossil horse and a large unknown carnivore. Finally, near the place where the first rolled-up skin was found, they found another 3 feet 8 inches by 3 feet in size.

The peculiar arrangement of the place, the skeleton that Eberhardt and his companions had already found there, the kitchen midden, the various walls, the heaps of dung and fodder, 3 feet deep in some places, all seemed to show that giant sloths had been kept alive in this special enclosed part of the cave. The excrements were obviously those of a large animal, since the best-preserved ones had kept their shape and were almost as large as an elephant's. Moreover, an examination of the skull of a sloth revealed that man must have brained it with large stones. Clean-cut bones showed that the beasts had then been dismembered with sharp cutting-tools and were, of course, finally eaten.

> The men who lived there ages ago [concludes Dr Hauthal] were accustomed to stable their domestic animals in this part of the cavern, reserving the rest for their own dwelling place.

It seemed indisputable that giant sloths were kept alive in the cave. Subsequent analysis of the excrements by a British expert called Spencer Moore showed that the animal's food was too cleanly cut at the end to have been done only by its blunt teeth. It must have eaten fodder that had been reaped by man.

Can one call these sloths true domestic animals? Dr Nehring and other scientists think not. Is it not more reasonable to suppose that the Mylodons were accidentally caught in the cave and that the Indians kept them prisoner as a supply of fresh meat? Or rather, since the depth of dung shows that a series of sloths were stabled there, that the Indians were in the habit of catching them and keeping them alive as a reserve in case food ran short? The most likely, considering the prodigious strength of these animals, which, though not savage, were well armed, is that men used to drive them into such caves, just as in India wild elephants are caught by driving them into stockades. This is far more probable than that they were really domesticated. No species of animal is less likely to become extinct than a domesticated one—and with good

reason. If the sloths were actually domesticated by the Indians—that is to say they bred in captivity—why does this happen no longer? No other instance is known of an animal which has ceased to be domesticated, and it is hard to see why anyone should abandon such an advance so useful to a people who live in dry plains where famine always threatens. But whether truly domestic or not, the giant sloths certainly lived side by side with men who fed them with grass, leaves and roots. This does not in the least agree with the terrifying description of the Tehuelches' monstrous *iemisch*.

The bitter controversy between the various factions about the beast's nomenclature and classification, too complex to be explained in detail here, was complicated even further when Dr Santiago Roth, Hauthal's colleague, took the fatal step of dragging in the native word *iemisch* and using it as a scientific name for the large carnivore, the end of whose femur had been found in the dung in the Cueva Eberhardt, justifying himself thus:

> This animal coincides in part with the description that Ameghino gives of the *Neomylodon*, even if it does not agree entirely, and I propose to give it the specific name of *listai*, replacing the generic name of *Neomylodon*, which is not adequate, by that of *Iemisch*.

This habit of deducing an entire animal from no more than the remains of a femur is all too frequent among palaeontologists misled by Cuvier's principle that "any sort of creature can, strictly speaking, be recognised by any fragment of any of its parts." Cuvier himself was led wildly astray by it, mistaking some pieces of a dinosaur first for those of a rhinoceros and then a hippopotamus. And as to this femur, it was at first thought by Sir Arthur Smith Woodward to belong to a fossil bear (*Arctotherium*) and finally attributed by Erland Nordenskjöld to a large jaguar many of whose bones he had found in the Cueva Eberhardt. Professor Roth was still firmly convinced that his own *iemisch* was the origin of the Tehuelche legend, remarking:

> It is very probable that it lived at a not very distant period, on the banks of lakes and rivers in the Andes and that it was the tiger *nahuel*, which gave its name to Lake Nahuel-Huapi.
>
> Although certain cats swim very well, like the jaguar, for example, which prefers to live near rivers and lagoons, I do not think, however, that there can have been a species of the Felidae which dwelt both in the water and on land.

He concludes that the present Indians knew the *iemisch* only by tradition and that no doubt they confused it with several other animals. It is more than likely, he says, that the amphibious creature they speak of is "the large rodent, a portion of whose femur I possess," which he had received from his colleague Hauthal who found it in the cave in 1897. Obviously he is determined that no light shall be shed on the problem unless it springs from his heap of old bones.

Professor Ameghino's feelings were no less proprietary, and he was not the man to suffer his *Neomylodon* to be so lightly dismissed and the *iemisch* to be turned into a feline. He brought out a third note in which he disingenuously and with great cunning combined the legendary beast with the remains from the Cueva Eberhardt, shamelessly inflating its size and altering the shape of its head:

> *Neomylodon listai* . . . is as big as a large ox but with shorter legs . . . it is about a third smaller than *Mylodon robustus*. Its body is covered with long, thick, coarse hair. . . . The very thick skin bears little bones identical to those in the fossil genus *Mylodon* in the deepest layer of the dermis. . . . The head is longer than the Mylodon's, ending in a pointed snout, and the external ears are only rudimentary. . . . The front tooth, though not separated by a diastema from the rest, is a little longer, a shade more canine in shape and more curved than the others. . . . The feet are flat; the toes are joined by a swimming membrane, and also armed with large sickle-like claws as in *Glossotherium*, *Catonyx* and *Mylodon*.

Finally, in a note published in German in March 1900, he went so far as to claim that the meaning of the word *iemisch* in Tehuelche was "little pebbles" (*kleine Steinkörnchen*) or "that-which-has-little-pebbles-on-it" (*etwas das kleine Steinkörnchen besitzt oder trägt*). But no expert on Patagonian dialects ever confirmed this etymology.

Without falling into the same error as Roth and Ameghino, who each insisted that his own little pile of remains had come from the *iemisch*, or believing, with Hauthal, that it was mythical, other scientists began to wonder what this animal might be. In 1900 a French traveller called André Tournouër wrote to his old professor, Albert Gaudry, that he had himself seen the mysterious animal, which he spelt *hymché*. He is a credible witness who had lived in the Argentine for a long while and made several expeditions to southern Patagonia to collect fossil mammals for the Paris Museum. On 14 January 1901 Professor Gaudry read Tournouër's letter to the Académie des Sciences in Paris:

My travels have enabled me to obtain from the Indians some information about the famous *hymché* (the *Neomylodon* according to F. Ameghino) but the superstitious terror that it inspires is such that it is difficult to disentangle the truth from the legends that their imagination has created. I shall only relate here two facts which have convinced me of the existence of a new animal in these parts.

Lying in wait one evening on the bank of a river in the interior, beside which I had pitched my camp, I saw emerge in the middle of the stream the head of an animal the size of a large puma. I fired, the animal dived and did not reappear.

As far as I could see in the dusk, its round head had dark brown fur, its eyes were encircled with light yellow hair, stretching in a thin line to the ear-hole. There was no external ear.

I described it to the Indian who acted as my guide; he seemed very frightened and assured me I had seen the mysterious *hymché*.

I was obliged to proceed on my way; but on a bank of river sand, a few miles further on, my Indian showed me some large feline-looking footprints which he said were those of the *hymché*.

With that patient care, of which only the Germans seem capable, Dr Robert Lehmann-Nitsche, anthropologist of the Natural History Museum of La Plata, undertook to discover the *iemisch*'s identity by searching through the old accounts of Patagonia and all the dictionaries of the Tehuelche and Araucan languages. He found that various words very close to the word *iemisch* all referred to one or other species of otter. Thus in the zoological section of Claudio Gay's *Historia Fisica y Politica de Chile* of 1847 the popular names for the *Lutra felina* described by Molina are *gato del mar* (Spanish for sea-cat), *nutria* (Spanish for otter), *chimchimem* and *chungungo*. In 1806 Luis de la Cruz had already referred to "*gùillins* or *chimchimems*, which are a sort of marine cat." And, to go back to even more ancient sources, Andres Febres' dictionary of Araucan which appeared in 1765 included:

Chimchimem: sea animal like a cat.
Sea cat: *coypu*,[1] *chimchimem*.
Coypu: river animal like a cat.
Otter: *ghùyllin*.

In a Patagonian vocabulary appended to an account of Moreno's travels in 1879 there is a word still nearer to the Tehuelche *iemisch*:

[1] The coypu (*Myocastor coypu*) is actually a large rodent. When the first Spaniards arrived in South America they called this creature *nutria*, Castilian for otter, an error still current among furriers. Its local name was *coipo*, *coypu* or *guiyá*. Spanish-speaking South Americans are now obliged to call the otter *nutria verdadera* (true otter) and the coypu *rata nutria* (otter-rat) or *nutria roedora* (rodent otter).

yem'chen, translated as *tigre de agua* (water-tiger) with the scientific name of *Lutra*. Moreno also says that in the Rio Santa Cruz lives a little otter which the Indians call *tigre de agua*. He says it is the *Lutra chilensis* or *hùillin* (obviously the same as *gùillin* or *ghùillin*); it is very rare in Rio Chubut and the Rio Negro, where it is known as *lobito de agua* (little water wolf).

Finally in the *Vocabulario Tzoneka ó Tehuelche* published by the ill-fated Ramon Lista in 1885 we unexpectedly find that the Tehuelche name for the otter is *jemechim*. And in a supplement to his *Viaje al País de los Tehuelches* he adds:

> The otter, or water-tiger as the Indians call it, is, after the deer, the most remarkable of the species of animals in the area of the sources of the Rio Chico (territory of Santa Cruz). It is darker in colour and larger in size than the *Lutra platensis*. Certain travellers identify it with the *Lutra chilensis*, but I am inclined to believe that it represents a species peculiar to southern Pantagonia.[1]

In short, the words *chimchimen*, *jemechin*, *yem'chen*, *hymché* and *iemisch*, whose common origin is evident, all describe a sort of otter—*Lutra felina*, according to Dr Lehmann-Nitsche probably.

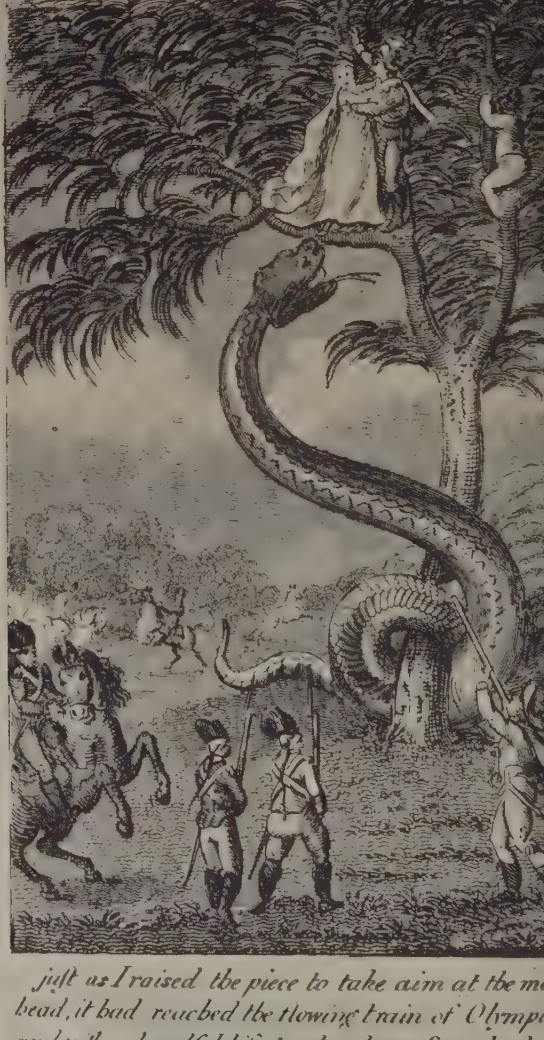
But, he goes on to remark, how could a harmless creature like an otter have acquired the *iemisch*'s terrifying reputation? The fact that the name "*tigre de agua*" was so often associated with an otter seemed to him to be due to a misunderstanding on the part of an English traveller, Captain George Musters, who was intrigued by the name *Nahuel-Huapi*, translated by Febres as "Tiger Island," of an island in southern Patagonia, and assumed that it must be named after the otters in the surrounding waters, since the jaguar, universally known by the Spaniards as *tigre*, was not found south of La Plata. Captain Musters did not know that the jaguar's area of distribution once reached to the Straits of Magellan. It was in fact the jaguar which gave Nahuel-Huapi its name

[1] According to the standard work, *Mamiferos Sud-americanos* (1940) by Cabrera and Yepes, there are three species of the genus *Lutra* in the southern half of South America:

1. In the north-east, *L. platensis*, from La Plata to the Matto Grosso in Brazilian territory.
2. In the west, *L. felina* or *chimchimen*, all along the Chilean coast and islands to Terra del Fuego (this species ventures into the sea and deserves the name of *gato de mer*).
3. In the south-east, *L. provocax* or *hùillin*, found in the Argentine, from Colchagua province to the tip of the country, and also extending to the other side of the Andes.

The jaguar (*above*) is an excellent swimmer, but it seems to be extinct in Patagonia. The natives have therefore transferred some of its evil character to a fabulous version of the otter (*below*).

The anaconda is never officially more than 20 feet long.



just as I raised the piece to take aim at the m
head, it had reached the flowing train of Olymp
and with a dreadful hiss tore her down from her hi
arms.

London, Pub. April 1, 1803 by I. Le

But there have always been tales of much larger snakes, some of them more plausible than this frontispiece of John Browne's *Affecting Narrative.*

and was the only animal to earn the name of "water-tiger" as we shall see from the early chronicles.

In his history of the Abipons (a people in the extreme north of the Argentine), published in 1783, the German Jesuit Martin Dobrizhoffer writes:

> In the deepest waters there usually hides an animal larger than any hunting-dog, called *tigre de agua* by the Spaniards and *yaguaro* by the Guaranis. It has a woolly hide, a long and tapering tail, and powerful claws. Horses and mules swimming across these rivers are dragged to the bottom. Soon afterwards one sees the intestines of the animal, disembowelled by the tiger, floating on the surface.

A similar, but more detailed, description, is found in a book by another Jesuit, Thomas Falkner, *A Description of Patagonia, and the Adjoining Parts of South America*, 1774:

> In my first voyage to cut timber, in the year 1752, up the Parana, being near the bank, the Indians shouted yaquaru, and looking, I saw a great animal, at the time it plunged into the water from the bank; but the time was too short, to examine it with any degree of perfection.
>
> It is called yaquaru, or yaquaruigh, which (in the language of that country) signifies, the water tiger. It is described by the Indians to be as big as an ass; of the figure the size of a large, over-grown river-wolf [1] or otter; with sharp talons, and strong tusks; thick and short legs; long, shaggy hair; with a long, tapering tail.
>
> The Spaniards describe it somewhat differently; as having a long head, a sharp nose, like that of a wolf, and stiff, erect ears . . .
>
> It is very destructive to the cattle which pass the Parana; for great herds of them pass every year; and it generally happens that this beast seizes some of them. When it has once laid hold of it's prey, it is seen no more; and the lungs and entrails soon appear floating upon the water.
>
> It lives in the greatest depths, especially in the whirlpools made by the concurrence of two streams, and sleeps in the deep caverns that are in the banks.

That the jaguar should be described as an amphibious animal is not at all surprising. Its habits may not be so aquatic as the otter's, but it is an excellent swimmer, always ready to leap into the water to catch its prey (especially otters) or to flee from danger. The great naturalist Felix de Azara in his *Apuntamientos para Historia Natural de los Quadrupedos*

[1] "River-wolves" writes Father Falkner elsewhere, "(which I take to be of the same kind as our otter in England)."

de Paraguay y Rio de la Plata (1802), tells a story, which he verified personally, how,

> a *yagouareté*, after crossing a broad and deep river, came and seized the horse in its teeth and, dragging it sixty paces across ploughed land, recrossed the river and reached the other side with its prey.

These early descriptions of the "water-tiger" remind one very forcibly of what the Tehuelche believed about their *iemisch*. The jaguar's physical appearance, its large size—larger than the puma—its impressive claws, its aquatic habits, its grim fondness for dragging horses and mules under water—everything fits.

Dr Lehmann-Nitsche thinks that confusion has arisen in the Patagonians' minds between the local species of otter (*Lutra felina*) and the jaguar (*Felis onca*), because the jaguar used once to spread to the very tip of South America, but is now known there only by hearsay. The Indians have gradually transferred its characteristics to the only aquatic beast of prey they know: the otter. That the jaguar was once found in the whole of Patagonia is proved by the early accounts, which assert that the country is infested with "tigers," and by the number of place-names in which the Araucan word *nahuel* appears. Rivers, lakes, islands and even farms are all named after the tiger. In the Province of Buenos Aires alone Dr Lehmann-Nitsche found no less than 43 places named after the tiger, of which 29 referred to watercourses or other aquatic sites, the jaguar's favourite habitat. And these names are found even in southern Patagonia. Moreover, the tiger, nahuel, plays a great part in Araucan legend. Finally, Antonio de Viedma reports in 1781 that the Indians in the Santa Cruz territory told him that the local fauna included "the tiger or *nahuel* and the lion or *pagi* (the puma)." There were jaguars near the Straits of Magellan until the end of the eighteenth century. It is only since then that they have gradually withdrawn to the north. The actual presence of jaguars at the very tip of South America is confirmed by the palaeontological discoveries, including the remains of the large jaguar found in the Cueva Eberhardt, to which Professor Roth gave the scientific name of *Iemisch*.

Dr Lehmann-Nitsche also collected, through his Araucan friend Nahuelpi, the traditions corresponding to the *iemisch* in the folk-lore of this neighbouring people. They told of an aquatic animal, with webbed feet, known as *nürüfilu*, or *zorro-vibora* (Spanish for viper-fox)—a good description of the otter's serpentine movements in the water. This monster, which the Araucans fear more than anything else, is reputed

to drag people into the water by winding its tail round them. Since the otter has no huge claws with which to snatch its victims, its supple and flattened, though not actually prehensile, tail has acquired this evil power in popular belief.

We now have all the details of the Tehuelche *iemisch*, which is surely a composite of the jaguar and the otter, and it is difficult not to accept Dr Lehmann-Nitsche's argument. There is still Tournouër's evidence of an animal the size of a large puma, but the German anthropologist does not reject out of hand the theory that larger species of otters live in some little-explored Patagonian lakes. Such rumours are not new, nor confined to the Argentine. Buffon in his *Addition à l'Article de la Saricovienne* (a name for the La Plata otter) wrote:

> M. Aublet, a botanical scientist, whom we have already quoted, and M. Olivier, surgeon to the King, who have both lived for a long time in Cayenne and the Oyapok country, have assured me that there are otters so large that they weigh as much as ninety or a hundred pounds; they keep to the large rivers which are little frequented, and one sees their heads above the water; they give cries that can be heard from very far off, their fur is very soft, but shorter than the beaver's; their ordinary colour is a very faint brown: these otters live on fish, and also eat any seeds that fall on the water from the river-banks.

The existence of this giant otter is now well established. It is the *Pteronura brasiliensis* known to the Brazilians as *ariranha* and to the Guaranis as *arirai*. The Uruguayans call it *lobo corbata* (cravat-wolf) or *lobo gargantilla* (collared wolf); it frequents certain rivers in eastern Brazil, Paraguay, Uruguay and the north-eastern tip of the Argentine. It may reach a length of 7 feet, of which 3 feet are tail. It is as large as a puma. It is by no means impossible or even improbable that an equally large species of otter may live in southern Patagonia. The otter is one of the hardest mammals to see because of its shy and amphibious habits. This is no doubt the reason why there are so many legends and superstitions about otters and other such amphibious mammals as the water-opossum or yapock (*Chironectes*) among the marsupials and the platypus among the monotremes.

After all, what is the *iemisch* but a Patagonian version of the Australian *bunyip*?

With the *iemisch* out of the way, the problem of the survival of a ground-sloth is still unsettled, though many zoologists seem tempted to think otherwise. What was the "hairy pangolin" that Ramon Lista

vainly shot at? And we must not forget that several people reported Tehuelche legends not about a large, savage and amphibious carnivore, but a burrowing and harmless animal that was said to be invulnerable. Its description agrees much better with one's idea of a sloth which had not, like the ai and unau, decided to live in trees. We must start again at the beginning and try to ignore the bitter controversy that poisoned the whole atmosphere and from which few of the protagonists emerged with honour.

Our first witness is Dr Moreno, whose evidence cannot be suspect because he does not believe that giant sloths survive. He reports that the Tehuelche and the Gennake tell of a sort of terrifying hairy beast, which is very rare, and of which they have received traditions from their ancestors. And in 1875, an old chief called Sinckel showed him a cave which was said to be the lair of one of these unknown animals which were called *ellengassen*. But the Indians never told him that the animal still lived.

Our second witness is Ramon Lista, whose works are still the authorities on Patagonian ethnography and geography. He says that the Tehuelche believe that in the Sierra Carhuerne (Santa Cruz territory) live evil spirits and monstrous quadrupeds which, according to their traditions, once carried off a whole family of Indians who were returning on foot from an excursion to Charre (the Patagonian name for Lago Argentino). This story can only be pure surmise, since no one lived to tell the tale. The only fact is that people attributed this family's disappearance to terrifying wild beasts.

Professor Santiago Roth is the third witness. The Tehuelche chief Kankel told him several times that his grandfather used often to speak of a very savage beast in the neighbourhood of Lake Buenos Aires (Santa Cruz territory). When this beast roared, all the other animals fled; and one day when his grandfather was hunting rheas near the lake it killed a herd of his horses. Poor Kankel was so frightened of this monster himself that no promises Roth could make would induce him to go within half a mile of the lake.

Our fourth witness is Rudolf Lenz, an authority on Araucan folk-lore. In one of the epics that he reports there appears a wild beast whose name the Araucans translate into Spanish as *lofo-toro* (that is *lobo-toro*) or, as Lenz translates it, "wolf-bull," the "wolf" being used as a sign of the beast's savagery. But he seems to me to have fallen into the mistake, natural to a German or an Englishman, of assuming that the first word is an adjective qualifying the second, whereas Latin languages are

constructed the other way round. Thus when the Araucans describe the otter in Spanish as *zorro-vibora* they mean a viperish fox, not a foxy viper. The name *lofo-toro* therefore means a bovine wolf, and not a wolvish bull. If one has only the actual Patagonian animals as terms of reference, one can hardly describe the appearance of a Megatherium or Mylodon better than by calling it a wolf as big and heavy as a bull, for the wolf is the only coarse-haired and rather shaggy beast, fairly low on its feet, in the country, and the bull introduced by the whites is the largest animal known there. Of course this is only very indefinite evidence, but it helps to reinforce what has been cited above. There is therefore little doubt that the Tehuelche and the Araucan traditions include a memory of a large and frightening hairy beast. From what we know of the present and the sub-fossil fauna of this area it can only be some kind of large ground-sloth.

It may be objected that the terror that these monsters arouse in the legends about them is incompatible with the domesticated or half-domesticated state in which gravigrades lived in the cave at Ultima Esperanza. But the people who kept Mylodons in these stables were not Tehuelche or Araucan but a preceding race, and in India many peoples are terrified of wild elephants, although others tame them.

Dr Lehmann-Nitsche thinks that all these legends refer to the past existence of jaguars and to oxen that have gone wild, and that there is no trace of any tradition among the Patagonians that recalls a memory of giant sloths; to imagine otherwise is needless and far-fetched, since he believes that these animals, once domesticated by a vanished race, have been extinct for many thousands of years. Personally I think it is going too far to say that these animals were extinct so long ago, for reasons that will follow.

Professor Florentino Ameghino was not always so misguided as when he introduced his *iemisch* into the controversy. After the publication of his first note, while other scientists were excavating the Cueva Eberhardt, he began burrowing no less busily into the early accounts of the discovery of the New World. In the *Historia de la Conquista del Paraguay, Rio de la Plata y Tucumán* (1740–6) by a Portuguese Jesuít called Pedro Lozano he read that from the frontiers of the province of Rio de La Plata to Patagonia there was a large and very savage beast called *su* or *succarath*, which was in the habit of carrying its young on its back. The natives were said to hunt it and make cloaks out of its skin. Therefore, thought Ameghino, it must be too thick and stiff to be used for

finer garments; this all fitted the Eberhardt Mylodon. Its method of carrying its young is a characteristic of existing sloths and also of the anteaters which, apart from their size, fit the *succarath* fairly well.

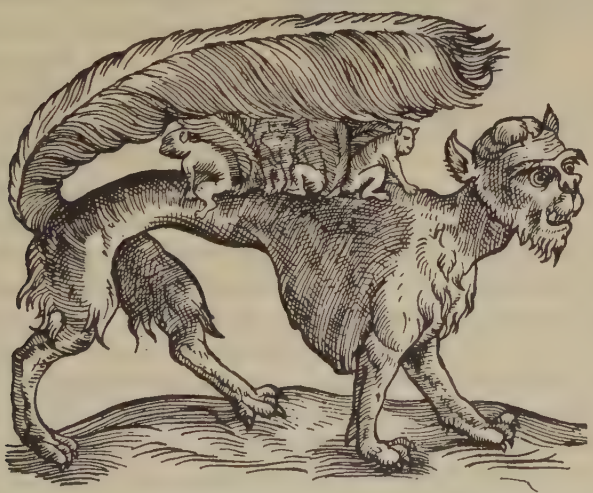
The name *su* reminded other scholars that Father Lozano's animal had long been known even in Europe and had been mentioned in the *Historia Animalium* (1551–8) by that Swiss Pliny, Conrad Gesner. This vast work was certainly not compiled in the critical spirit of modern zoology, and it includes several fantastic monsters alongside familiar animals. It is, however, a summary of all the zoological knowledge available in the sixteenth century and remained a work of reference for 200 years. It mentions the *su* (*de Subo*) after the *Descriptionis Americae* (*cap. lvi*) of Andreas Theuetus.

To get to the bottom of the matter let us refer to André Thévet's original work, which turns out to be called *Les Singularitéz de la France Antarctique, Autrement Nommée Amérique et de Plusieurs Terres et Isles Découvertes de Nostre Temps.* This book, published in 1558, is unfortunately little known and its author quite unrecognised. It describes a long peregrination made three years before by Father Thévet, who was to become almoner to Catherine de Medici and then historiographer and cosmographer to Charles IX. It was not only one of the first works in French about America, but also one of the first to describe the natural history of the New World, since it appeared only 23 years after Oviedo's famous *Historia General y Natural de Las Indias* (1535). Thévet, who was to publish a universal cosmography in 1575, was one of the most brilliant and learned minds of the French Renaissance.[1] Being curious about "prodigies of nature," he made a natural history collection, and despite the slanders current about his "bad faith and extreme credulity," his writings show that he was a very shrewd observer. In his description of his travels there are sober and exact descriptions of many strange birds, such as the penguin (which he calls *aponar*) and the toucan, as well as such mammals as the agouti, armadillo, ai (*raiit* or *haiit*) and the manatee, which, I should point out, he does not mistake for a mermaid —despite all the tales he had heard about those fabulous creatures. There is thus some reason to credit what he says about the region "of the Straits of Magellan."

[1] It was he who first introduced the use of tobacco into France—not Jean Nicot who is credited with this deed in most works of reference and has lent his name to nicotine. He brought back from Brazil some *petun* or tobacco which he described in 1556 as *herbe xaintongeoise.* Nicot did not send his leaves of tobacco to Paris until 1560.

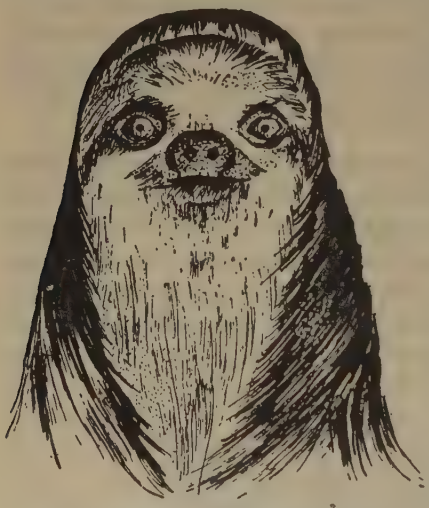
This region is of the same temperature as Canada and other countries that approach our Pole: thus the inhabitants dress themselves in the skins of certain beasts, which they call in their language *su*, which is as much as to say water: for, in my judgment, this animal lives for most of the time on the banks of rivers. This beast is very wonderful, made in very strange fashion, wherefore I have chosen to show it in a picture. Another thing: if it is pursued, as many of the people of this country do in order to have its skin, it takes its young on its back, and covering them with its long and large tail, escapes by fleeing with them. However the Savages use a trick to catch this beast: making a deep pit near the place where it is in the habit of making its abode, and covering it with green leaves, so that when running, without suspecting the ambush, the poor beast falls in this pit with its young. When it sees that it is caught, it maims and kills its young (as if maddened): and gives such terrible cries that it makes the Savages very fearful and timid. Yet in the end they kill it with arrows and then they flay it.

The naïve picture which accompanies the text shows a very emaciated sort of lion with a plume of a tail like an anteater's and a grotesque head somewhat reminiscent of a bearded man. On its back crouch half a dozen young ones. It is more than likely that this picture was not drawn by Thévet himself but by someone else relying on his verbal description, for this was the usual practice at this time, and explains why so many animals which are correctly described in the text are so



75. Naïve drawing of the *su* or *succarath*, after Father André Thévet (1558).

strangely distorted in the pictures. The text, for instance, makes it quite clear that the bison is a sort of hairy and hump-backed bull, but the picture is not in the least like one. If we bear this in mind, our picture could very well refer to one or other of the giant sloths, especially the Mylodon, which, unlike the Megatherium, had a long tail. It was no doubt because the artist was told it had claws that he gave it paws like a lion. The human-looking head shows that it was not an anteater—for they all have tube-shaped skulls. On the other hand it could have been a sort of sloth. Compare it with a recent portrait of an ai drawn from nature by I. Cooper and you will see that the gravigrades have faces like a caricature of a man.



76. Portrait of an ai (after a recent water-colour by I. Cooper).

The word *su* does not seem to mean water, as Thévet suggests. Professor Ameghino claims that the old Tehuelche use the word *su* or *suc* to mean cloak or covering, and that *carth* or *carrath* means a skin. Hence, he says, Lozano's word *succarath* means "cloak of skin" and supports the theory that the animal was hunted for its hide. Dr Lehmann-Nitsche confirms part of this, stating that the Patagonian word for covering is *sokga*, but thinks that the Portuguese Jesuit's description shows that the *su* was not a giant sloth, for he took the trouble to weigh the piece of skin 3 feet 8 inches by 3 feet in size from the Cueva Eberhardt and found that it weighed no less than 39 pounds, although it was far too small to make a cloak. But this is no reason why the *su*'s skin, if it really was full of bony nodules, should not have been used for making armour. The word *su* can mean any kind of covering, whether it is worn for warmth or for protection. And the armour worn by knights sometimes weighed more than 100 pounds. On the other hand, even if the *su* was a ground-sloth, there is no reason why its skin should have contained bones. There are no bones in the skins of the Megatherium, Lestodon or Scelidotherium, which no doubt were thick and heavy—but

not much heavier than some furs worn even in our mild climate by the fashionable.

All in all it seems quite likely that Father Thévet's *su* is some kind of ground-sloth, and that these animals lived in Patagonia until a fairly recent date—let us say the Middle Ages.

At the turn of the century many scientists' scepticism had been much shaken by the accumulation of converging evidence: Ramon Lista's hairy pangolin—so very like a Mylodon; the discovery of such well-preserved remains; the Tehuelche and Araucan legends, and finally Father Lozano's story, whose original source I have just quoted. Even the Director of the Natural History Museum in London, Sir Ray Lankester, eventually admitted that large ground-sloths might survive in some little-known or almost unexplored part of Patagonia. The *Daily Express* sponsored an expedition to bring back a living Mylodon, thus resuscitating King Charles IV's command, this time with more encouragement from the scientists. But when the first searches yielded nothing, the leader of the expedition, Hesketh H. Prichard, grew impatient before he had even reached Last Hope Inlet and went home to England in a huff, hardly concealing his disappointment and furious at his own failure, telling everyone that he had been hoaxed and that the Patagonian legends were a complete invention. This was almost as good as saying that the Tehuelche were liars, Lozano and Thévet romancers, the remains of Mylodons were illusions, Ameghino a madman and Lista a visionary.

Today, half a century later, the matter is still at a dead end. Cavendish's and Koslowsky's expeditions came back as empty-handed as Prichard's, and scientists have therefore concluded that living Mylodons no longer exist. It has also been pointed out, very justly, that the Tehuelche accounts never come from direct witnesses but always refer to third parties, who doubtless never saw the fabulous beast either. Dr Carlos Rusconi of the Natural History Museum of Mendoza came to this disappointingly negative conclusion when he drew up a summary of the affair, putting things in their proper perspective, in 1949. All the same he had in all honesty to admit that people still regularly came to him with "more or less trustworthy reports about the existence of a large animal in certain lakes in the mountains to the west of the Santa Cruz territory." The inhabitants of the south of Malalhue in the province of Mendoza told him of "the existence of rare and fierce animals which gave a howl like a wolf but were neither foxes nor pumas: in fact

they are very well-known to these people as much by their habits as by their tracks which they leave in moist earth where they are known to come to attack their prey."

Who knows what may be found when the most hidden corners of Patagonia are more thoroughly explored? F. Outes has pointed out that in the area of the Rio Salado and the Tapalqué stream the bones of two other supposedly fossil animals have been found in a surprisingly fresh state: the Glyptodon (*Doedicurus*), a sort of living tank which I have mentioned above, and a sabre-toothed "tiger," the Smilodon. And in 1884, in a cave near the Rio de los Patos in the Cordillera of the Andes, Dr Moreno found paintings in ochre which he thought represented a Glyptodon's shell.

But is Patagonia the right place to look for any survivors of these animals? There is not the slightest doubt today that in South America man knew all these giant mammals that seem to belong to a vanished age. It is also well established, on irrefutable palaeontological proof, that many of them once migrated to North America, where they were contemporary with man about 10,000 years ago. From the Miocene to the end of the Pleistocene, and even at the beginning of the present period, giant sloths spread north through Uruguay, Brazil, Bolivia, Colombia, Central America, Mexico and even part of the United States, where their remains have been found in kitchen middens.

It is now proved beyond a doubt that the remains of Mylodons unearthed at the southern tip of Patagonia have been preserved in their cave for many centuries and that these huge and harmless beasts were exterminated there by the Indians who preceded the Tehuelche. The Carbon 14 method of dating has fixed the age of the dung in the Cueva Eberhardt in which the Mylodon's bones and skin were found at about 10,000 years (to within 400 years either way). On the other hand, one may suspect that giant sloths—or at least smaller related ground species —were known farther north in the Argentine at the time of the conquest of America, as appears from the old chronicles. And perhaps some few survivors were responsible for the legend current among the Tehuelche during the last centuries and for Ramon Lista's more recent report.

No doubt the sloth empire covered its greatest area some 10,000 years ago. At this time there must have been a large number of intermediate forms between the giant species in the savannah and the little species in the forests. Slaughtered by the nomadic hunting Indians, both in the pampas of the south and the green prairies of the north, the largest sloths would have retreated, as the jaguar did, to the tropical forests,

where they could find a safer refuge. All the same, it is unlikely that the really gigantic species could have adapted themselves to the inextricable virgin forests, the habitat in which the small tree species flourished. On the other hand, it is not difficult to see how the medium-sized ground-sloths might have survived in wooded savannah or sparse forest, or even on the fringes of or in clearings in the densest of jungles. For the great ground-sloths were not destroyed by any revolutionary geological or climatic change. From the number of their remains in kitchen middens it is clear that these large and peaceable beasts, like so many other species, were victims of man's gluttony. If such is the case, what has happened to them in their impenetrable retreat in the vast Amazonian *selva* and the *boscosa* of the Andes, through which they passed in the course of ages? It is hard to see what, in the peace of these forests rarely inhabited by man, could have led to their extinction. Only human traps were able to put an end to these armoured brutes against which beasts of prey were powerless. Might they not still live in this "green hell" and find it a heaven of peace? At all events, as we shall see, this would explain some of the rumours that are still current in an area where "nothin' would surprise."

CHAPTER THIRTEEN

The Giant Anaconda and Other Inland "Sea-Serpents"

> Th'old Dragon under ground
> In straiter limits bound . . .
> . . . Swindges the scaly Horrour of his foulded tail.
> JOHN MILTON, *On the Morning of Christ's Nativity.*

IN 1906 the race for rubber was on, and to get it dirt cheap settlers did not shrink from enslaving the Amazon Indians, flogging, torturing and even killing them at the slightest whim. The tribes that resisted were massacred, their villages pillaged and burnt. Officials and soldiers sent to keep order were as savage and cruel as the *seringueiros*. In the rich rubber plantations along the Rio Abuna and the River Acre (Rio Macarinarra), which marks the southern boundary of western Brazil, the northern frontier of Bolivia and part of that of Peru, a bitter dispute arose between the three countries about the exact position of their frontiers. War was on the point of breaking out.

The Royal Geographical Society of London was called in to act as mediator and sent Major Percy Fawcett, an artillery officer of 39, to make a thorough survey of the area in dispute. It was to perform this thankless task that he first penetrated the vast forests of the Amazon, in which he was to vanish without trace 20 years later.

It was in January 1907 that he first heard of gigantic snakes in the little out-of-the-way hamlet of Yorongas, a mere *barraca* of two or three of the *seringueiros*' sheds, not far from the source of the River Acre. It was the last outpost of civilisation on the fringe of utterly unexplored country.

> The manager at Yorongas [Fawcett writes in his memoirs] told me he killed an anaconda fifty-eight feet long in the Lower Amazon. I was inclined to look on this as an exaggeration at the time, but later, as I shall tell, we shot one even larger than that.

This happened two or three months later on the Rio Abuna, upstream of its junction with the Rio Rapirrão:

We were drifting easily along in the sluggish current not far below the confluence of the Rio Negro when almost under the bow of the *igarité* there appeared a triangular head and several feet of undulating body. It was a giant anaconda. I sprang for my rifle as the creature began to make its way up the bank, and hardly waiting to aim smashed a .44 soft-nosed bullet into its spine, ten feet below the wicked head. At once there was a flurry of foam, and several heavy thumps against the boat's keel, shaking us as though we had run on a snag.

77. Major Percy Fawcett's encounter with a 62-foot anaconda (from a drawing by his son Brian).

With great difficulty I persuaded the Indian crew to turn in shorewards. They were so frightened that the whites showed all round their popping eyes, and in the moment of firing I had heard their terrified voices begging me not to shoot lest the monster destroy the boat and kill everyone on board, for not only do these creatures attack boats when injured, but also there is great danger from their mates.

We stepped ashore and approached the reptile with caution. It was out of action, but shivers ran up and down the body like puffs of wind on a mountain tarn. As far as it was possible to measure, a length of forty-five feet lay out of the water, and seventeen feet in it, making a total length of sixty-two feet. Its body was not thick for such a colossal length—not more than twelve inches in diameter—but it had probably been long without food. I tried to cut a piece out of the skin, but the

beast was by no means dead and the sudden upheavals rather scared us. A penetrating foetid odour emanated from the snake, probably its breath, which is believed to have a stupefying effect, first attracting and later paralysing its prey.[1] Everything about this snake was repulsive.

Such large specimens as this may not be common, but the trails in the swamps reach a width of six feet and support the statements of Indians and rubber pickers that the anaconda sometimes reaches an incredible size, altogether dwarfing that shot by me. The Brazilian Boundary Commission told me of one killed in the Rio Paraguay exceeding eighty feet in length!

This did not prevent Fawcett from being called an arrant liar when he came back to London and claimed to have shot an anaconda 62 feet long. Yet one can read through his notebooks from end to end without finding any trace of exaggeration about the size or ferocity of the animals which he met on the Amazon. On the contrary, one is more apt to find notes like the following, written after he had been attacked by a *surucucu* or "bushmaster" (*Lachesis muta*) upon which he had nearly stepped:

It was quite nine feet long and about five inches thick, and the double fangs, if in proportion, would be over an inch in length. Experts claim that these snakes reach a length of fourteen feet, but I have never seen one so big.

Fawcett was certainly a dreamer, and his dreams sometimes led him to cherish the wildest hopes, but he was not a liar. What he saw he always reported in a very matter-of-fact way; his interpretations are sometimes fantastic, but his observations never are. The most striking thing in his memoirs is the contrast between the sordid hell he describes and the splendour of the lost cities that he searched for till his death.

What then is the official record size for an anaconda (*Eunectes murinus*) in the zoological textbooks? Most of them will allow 30 feet. The American herpetologist Thomas Barbour, the great Brazilian expert Dr Afranio do Amaral of the Institute at Butantan and Dr Jose Candido de Melo of the Rio de Janiero Zoo all agree on 45 feet; but other experts are more cautious. Hyatt Verrill, for instance, writes:

Personally I do not believe the anaconda ever attains a length of more than twenty feet. Dr. Ditmars is even more conservative and sets

[1] While snakes' breath has, of course, none of the stupefying properties with which it is often credited, it can clearly be very foul, like that of other carnivores. A lion-tamer has wittily said that the chief risk in putting one's head in a lion's mouth is of being asphyxiated. Here it is more likely that the insufferable stench comes from the snake's cloacal musk-glands which play some part in sexual attraction.

the limit at nineteen feet. But as I have personally killed anacondas which were within a fraction of an inch of twenty feet from tip of nose to tip of tail, I add one foot to this famous scientist's limit. But until I have seen a living anaconda, or an unstretched skin which actually measures more than twenty feet, and no one has produced such yet, I shall maintain twenty feet as the greatest length reached by this largest of American snakes.

A tanned snakeskin is always noticeably longer than it was on the living animal, since it has to be stretched in the drying. If it is unscrupulously overstretched it can be considerably lengthened. Hyatt Verrill claims to have seen the skin of an anaconda which measured only 18 feet alive but had been stretched to 23 feet. But a skin which has been treated in this way can, he says, easily be recognised by anyone familiar with the large snakes. "A stretched hide is always too narrow in proportion to its length, and moreover, the scales will be separated and out of place and the markings on the skin will be distorted." All this is very true. Nevertheless it is well-known that the Institute at Butantan in Brazil has an anaconda skin 33 feet long. I do not think it could have been stretched to this length from only 20 feet, or that such a reputable scientific institution would have allowed it to be so overstretched. It must have come from a snake at least 26 feet long. Besides, if we are to believe Curran and Kauffeld, the greatest American experts on snakes, the largest specimen which has been exhibited in a zoo measured 26 feet. And you can't stretch a living snake.

According to F. Angel, the late expert on herpetology in the Paris Museum, the largest snakes of any kind of which we have certain records are pythons from the Old World:

> A French traveller, Charles Mayer, brought back alive to Europe a reticulated python from Asia which was 32 feet long. Another naturalist, William Hornaday, killed a 30-foot python. These are the largest specimens which are known with certainty.

Verrill admits the second, but seems ignorant of the first.

I should also add that at El Fayum in Egypt, parts of the spinal column of a python called *Gigantophis* belonging to the Middle Eocene period were dug up; the entire animal was reckoned to be between 42 and 65 feet long. Fawcett's snake would not necessarily have been the longest.

Verrill maintains that the much exaggerated lengths that travellers and Indians often attribute to anacondas are due to the difficulty of judging the size of a living snake. It is a fact which I have proved for

myself that it is extremely hard to judge the length of a creature coiled upon itself or wriggling along, often at high speed. The eye, which finds it hard enough to judge the length of a straight line exactly, is generally helpless when dealing with a curve. Ask anyone to tell you the length of a circle, the perimeter of a pool, for instance, and you will be surprised what huge errors they make. You always have to resort to a formula to measure a curve.[1]

Verrill saw an anaconda curled up on a ledge of rock in Guiana and made the experiment of asking each of his companions to guess its length:

> The camera man, who had never before been in the jungle, said sixty feet. The missionary who had spent seven years in the interior and had seen scores of big snakes was more conservative and said thirty feet. The Indians' estimates varied from twenty to forty feet; my camp boy, who had accompanied a party of snake collectors a few years earlier, said thirty feet, while the grizzled old "captain" remarked, "Takin' all de fac's of da case in consi'ation, I don't can state posritively, chief, but Ah knows for de truf tha' camudi (anaconda) is jus' *too* long."
>
> A twenty-two rifle bullet through the head brought an end to the big anaconda's career and when he was straightened out and measured he proved to be exactly nineteen feet and six inches in length. But what a monster! About his middle he measured thirty-three inches and a fraction and he weighed over 360 pounds and was a heavy load for five Indians. So huge were his proportions that even after we had measured the creature it was difficult to believe that he was so "small."

Verrill's argument is sound enough, but is his experiment as instructive as he would have us think? The Indians who judged that a *coiled up* snake was 20 feet long were remarkably accurate in their observation, while those who put it at 40 feet would surely have been much more accurate if they had seen the snake uncoiled. And even if, on the evidence of the missionary, we must halve the dimensions of snakes reported by people who know the country well, we shall still find many instances of specimens much larger than the record skin in the Institute at Butantan.

Fawcett could not have misjudged the length of his snake, at least not to any great extent, since he measured it dead on the river-bank. His phrase "as far as it was possible to measure" may mean that he could

[1] I therefore suggest a coefficient of 1·5 (about $\pi/2$) to be multiplied by the distance between the snake's head and tail when crawling on the ground to give the length of its body. This assumes that the snake consists of semi-circles on each side of the straight line of its path and is *very* approximate, but it gives better results than trying to "unwind" the snake mentally.

not measure the 17 feet in the water, but more probably that he had no exact means of measurement at hand and so in the usual British fashion paced out its length with his feet—and could not have gone so far wrong. If he had merely guessed its length he would not have given exact figures but have written "about 50 feet out of the water and 15 feet in the water."

Other more recent explorers of the Amazon country mention anacondas much longer than the 20 feet that Verrill and Ditmars grudgingly concede. Let us begin with the Marquis de Wavrin, who is admittedly not a professional zoologist, but he is a careful observer and his reports are always unromantic and unemotional. I remember him as a great, lean fellow with cool, inquiring eyes, for I was to have gone with him in 1940 as zoologist on his attempt to find the sources of the Orinoco, a project which was foiled by the war. I can confirm that he can be trusted to speak the truth. He has much to say about anacondas:

> Those generally met with along the rivers measure between 20 and 25 feet long. I have seen some over 30 feet long and there are even larger ones, if the natives are to be believed.

He once shot an anaconda about 25 feet long; it fell into the water from the branch around which it was coiled, and he said he would like to fish up the body, which could still be seen quivering in some 3 feet of water. His canoe-men replied that it was a waste of powder to shoot such a small snake and a waste of time to stop and pick it up. They also told him:

> On the Rio Guaviare, during floods, chiefly in certain lagoons in the neighbourhood, and even near the confluence of this stream, we often see snakes which are more than double the size of the one you have just shot. They are often thicker than our canoe.

These snakes need not belong to a new species. They could be outsize individuals of a known species. Dr Maurice Burton has pointed out that

> there is always a percentage, admittedly small, of individuals in every species which grow to an unusually large size. I have shown elsewhere that if the average height of a male Londoner be taken as 5 ft. 8 in., then an unusually tall man would be one 6 ft. 4 in. high, but the record height is 9 ft. 3 in. If we take the various species of mammals for which reliable measurements are available, we find that the outsizes of species are: 68 per cent. above average size, and 40 per cent. above the unusually large.

Of course, anacondas are not mammals, and reliable measurements are not available. All the same this rule should hold good for reptiles, and if, as the *seringueiros* and many hunters and explorers maintain, anacondas 30 feet long are quite often seen, there might be unusually large specimens 38 feet long and monstrous freaks over 50 feet long—which is not so very far from Fawcett's 62 feet.

The stories of anacondas 70 feet long seem to be quite incredible. Yet I have heard from the witness's own mouth a circumstantial account of how a specimen of this astonishing size was killed. Having questioned and cross-questioned my informant for several days, I am as convinced of his sincerity as if I had witnessed the incident myself.

In 1947, after the Chavantes had massacred several Brazilian officials, Francisco Meirelles, of the Service for the Protection of the Indians, organised a new expedition to try to establish peaceful relations with this wild tribe on the Middle Araguaya. This undertaking, which lasted from February to July, was eventually crowned with a faint measure of success. The party of some 20 men included two Frenchmen: the very young explorer Raymond Maufrais, who was later to disappear in the Tumac-Humac in Guiana where his father continues to search for him with untiring courage, and the painter Serge Bonacase of Paris, who told me this story.

At the end of March the expedition had reached Ilha do Bananal, an island between two branches of the Araguaya, and set up its base camp there. The members of the expedition spent several days preparing themselves for life deep in the *sertão*, as the wilderness is called, by going off on long reconnaissance and hunting expeditions, as much as 60 miles from their base camp. During one of these trips a party of seven or eight men went hunting capybaras in the swampy area between the Rio Manso—known as the Rio das Mortes, or River of Death, because the Chavantes killed anyone who crossed it—and the Rio Cristalino.

> The guide [Serge Bonacase told me] pointed out an anaconda asleep on a rise in the ground and half hidden among the grass. We approached to within 20 yards of it and fired our rifles at it several times. It tried to make off, all in convulsions, but we caught up with it after 20 or 30 yards and finished it off. Only then did we realise how enormous it was; when we walked along the whole length of its body it seemed as if it would never end. What struck me most was its enormous head, which was like this. [He stretched out his arms in front of him with his hands together, thus forming a triangle with 2-foot sides and an 18-inch base.]

> As we had no measuring instruments, one of us took a piece of string and held it between the ends of the fingers of one hand and the other shoulder to mark off a length of 1 metre. Actually it could have been a little less. We measured the snake several times with this piece of string and always made it 24 or 25 times as long as the string. The reptile must therefore have been nearly 23 metres long [75 feet].

Even if the piece of string was only 90 centimetres (3 feet) long—and I don't think we can allow a margin of error of more than 10 per cent—the snake would have been between 72 and 75 feet long.

Serge Bonacase added that the animal's diameter was almost half the length of the measuring-cord, probably nearly 18 inches. The beast was so heavy that they could not lift it up in the middle of its body. They could only guess at its weight.

No doubt the reader will wonder, as I did, why they did not take photographs of such a trophy. The reason is simple. The Service for the Protection of the Indians had forbidden them to take cameras—which could easily have terrified the Chavantes and caused another massacre—on their particularly tricky mission.

But why didn't they think of bringing back its skin or its head? Serge Bonacase's answer to this question was:

> First of all, none of us seemed to realise that there was anything exceptional about our prize. There were no zoologists among us. The Brazilian officials who had spent much of their lives in this country did not seem to be particularly surprised. As for me, I had heard so many tales of giant snakes that I supposed the whole of the Amazon was crawling with monsters of this size.
>
> Of course, we should have liked to take the snake's skin back, but we had neither the time to skin the beast nor to prepare its hide. We were also very tired, and in that country you must never let yourself linger by the way or encumber yourself with extra luggage. Think what a piece of skin more than 60 feet long by 4 feet 6 inches wide would have weighed! We should have had our work cut out to carry it—or for that matter the head. Besides, who would have been crazy enough to lug a piece of rotting meat on his back in that heat through country infested with insects?

It was undoubtedly an anaconda of the known species. "It was a very deep dark brown," Bonacase told me, "marked on the sides with almost black irregular oval rings."

This would seem to imply that a length of 30 feet, which is supposed to be exceptional for an anaconda, is really less than the normal size of an adult. Or are there two geographic races of *Eunectes murinus* of different sizes?

To return to the Marquis de Wavrin, let us proceed to what may be another kind of snake. His canoe-men went on to tell him of many encounters with real monsters, fresh-water sea-serpents, as it were:

> During a flood some Piapoco Indians tried to go directly from their hut well upstream of the Rio Uva to the Rio Guaviare by taking short cuts through the marshes and lagoons. They had just crossed one of these little lakes, when they heard a sound behind them like thunder; yet the sky was clear and there was no wind. However, they saw the surface of the lake in turmoil; waves broke even on the bank which they had just reached. It must therefore be an animal thrashing about in mid-water. For an instant they could see a monstrous snake's head. The reptile swam for a moment on the surface and then dived. If their canoe had been out in the lagoon they would probably have been devoured; as it was they were capsized. They vowed never to risk going that way again.

Naturally. It was also natural that the Marquis de Wavrin should have been inclined to believe their story when later he reached the Rio Putumayo the day after an ox had been carried off by a monstrous snake. The people "were all still shaken by what had happened." Which was also very natural.

Lorenz Hagenbeck, late director of the Hamburg Zoo, also seemed convinced of the existence of a kind of South American water-snake larger than the largest anaconda and of quite staggering size. The son of the great Carl, he was brought up to the business. For more than a century travellers and animal-catchers sent zoological information from all over the world to the Hagenbeck dynasty, who were proud to supply zoos in every country with specimens of rare and sometimes even supposedly extinct animals. It was an explorer sent out by a Hagenbeck who caught the first pygmy hippopotamus. But the Hagenbeck family papers also include several reports, transcripts of which I have seen, about an aquatic snake from the Amazon which is much larger than the largest anaconda and which the Indians seem also to distinguish by the name of *sucuriju gigante* or "giant boa."

Here I should explain that the anaconda (*Eunectes murinus*) is a member of the boa family and is often called the water boa, meaning thereby that while other boas only occasionally dive into the water, the anaconda, whose nostrils can close hermetically, remains immersed much longer and is more truly aquatic. There is only one species of anaconda: it is marked with oval or lozenge-shaped spots and rings of dark or blackish brown on an olive-green, grey or brownish background. Among the

many species of boas the colour varies greatly. The back is often marked with light oval patches, generally pinkish, on a darker background, usually a rich brown. The boa-constrictor is the largest known to herpetologists, who state that no specimen caught or killed has been much longer than 12 feet. Nevertheless there have always been stories of much larger boas. One John Browne wrote of an "*ibibaboka*" so fearsome and monstrous (see plate facing page 273) that one is surprised to learn that it was only 27 feet long. But this story of the sole survivor of a party of six deserters from the garrison of artillery at St Helena who got lost in the virgin forest in 1799 and found themselves in the middle of one of the most romantic of love stories has never gained much credit.

George Gardner's evidence in his *Travels in the Interior of Brazil* is much more trustworthy. After stating that boa-constrictors are found throughout the Province of Goyaz, especially on the wooded banks of lakes, marshes and rivers, he adds that some are found which reach the enormous length of 37 feet.

> The largest I ever saw was at this place, but it was not alive. Some weeks before our arrival at Sapê, the favourite riding horse of Senhor Lagoeira, which had been put out to pasture not far from the house, could not be found, although strict search was made for it all over the Fazenda. Shortly after this, one of his vaqueiros, in going through a wood by the side of a small river, saw an enormous Boa, suspended in the fork of a tree which hung over the water; it was dead, but had evidently been floated down alive by a recent flood, and being in an inert state, it had not been able to extricate itself from the fork before the waters fell. It was dragged out to the open country by two horses, and was found to measure thirty-seven feet in length; on opening it, the bones of a horse, in a somewhat broken condition, and the flesh in a half digested state, were found within it, the bones of the head being uninjured; from these circumstances we concluded that the Boa had devoured the horse entire.

Gardner's incredible 37-foot boa is a dwarf compared to the *sucuriju gigante*, of whose existence Lorenz Hagenbeck was firmly convinced, being a close friend of the two priests, Father Heinz and Father Frickel, who reported it, and never doubting their sincerity for a moment. The first report comes from Father Victor Heinz himself:

> During the great floods of 1922, on May 22 at about 3 o'clock to be exact, I was being taken home by canoe on the Amazon from Obidos; suddenly I noticed something surprising in midstream. I distinctly recognised a giant water-snake at a distance of some 30 yards. To

distinguish it from the *sucuriju*, the natives who accompanied me named the reptile, because of its enormous size, *sucuriju gigante* (giant boa).

Coiled up in two rings the monster drifted quietly and gently downstream. My quaking crew had stopped paddling. Thunderstruck, we all stared at the frightful beast. I reckoned that its body was as thick as an oil-drum and that its visible length was some 80 feet. When we were far enough away and my boatmen dared to speak again they said that the monster would have crushed us like a box of matches if it had not previously consumed several large capybaras.

South of Obidos one of these monsters was killed, it seems, just as it was swallowing a capybara on the muddy river-bank. Its stomach contained no less than four adult specimens of these huge rodents. Elsewhere two large round excrements were found full of animal hair and with a bone from an ox's foot sticking out of one of them. Father Heinz also writes:

My second encounter with a giant water-snake took place on 29 October 1929. To escape the great heat I had decided to go down the river at about 7 p.m. in the direction of Alemquer. At about midnight, we found ourselves above the mouth of the Piaba when my crew, seized with a sudden fear, began to row hard towards the shore.

"What is it?" I cried, sitting up.

"There, a big animal," they muttered, very excited.

At the same moment I heard the water move as if a steamboat had passed. I immediately noticed several feet above the surface of the water two bluish-green lights like the navigation lights on the bridge of a river boat, and shouted:

"No, look, it's the steamer! Row to the side so that it doesn't upset us."

"*Que vapor que nada*," they replied. "*Una cobra grande!*"

Petrified, we all watched the monster approach; it avoided us and recrossed the river in less than a minute, a crossing which would have taken us in calm water ten to fifteen times as long. On the safety of dry land we took courage and shouted to attract attention to the snake. At this very moment a human figure began to wave an oil-lamp on the other shore, thinking no doubt, that someone was in danger. Almost at once the snake rose on the surface and we were able to appreciate clearly the difference between the light of the lamp and the phosphorescent light of the monster's eyes. Later, on my return, the inhabitants of this place assured me that above the mouth of the Piaba there dwelt a *sucuriju gigante*.

Father Heinz now began to study the subject with fervour, and to collect the reports which he eventually sent to Hagenbeck. One witness was a Portuguese merchant called Reymondo Zima, well known to Father Heinz, who had lived for nine years opposite the town of Faro

on the Rio Jamunda. His story was published by a newspaper in Rio de Janeiro.

> On 6 July 1930 I was going up the Jamunda in company with my wife and the boy who looks after my motor-boat. Night was falling when we saw a light on the right bank. In the belief that it was the house I was looking for I steered towards the light and switched on my searchlight. But then suddenly we noticed that the light was charging towards us at an incredible speed. A huge wave lifted the bow of the boat and almost made it capsize. My wife screamed in terror. At the same moment we made out the shape of a giant snake rising out of the water and performing a St Vitus's dance around the boat. After which the monster crossed this tributary of the Amazon about half a mile wide at fabulous speed, leaving a huge wake, larger than any of the steam-boats make at full speed. The waves hit our 43-foot boat with such force that at every moment we were in danger of capsizing. I opened my motor flat out and made for dry land. Owing to the understandable excitement at the time it was not possible for me to reckon the monster's length. I presume that as a result of a wound the animal lost one eye, since I saw only one light. I think the giant snake must have mistaken our searchlight for the eye of one of his fellow-snakes.

At this same place during a motor-boat journey in 1948 Paul Tarvalho, an old pupil of Father Heinz, saw a giant snake emerge from the water some 250 to 300 yards away; he reckoned it was about 150 feet long. For a moment it followed the boat, which made off at top speed.

The Franciscan Father Protesius Frickel, priest at Oriscima, was more courageous. When he was on an expedition on the upper reaches of the Rio Trombetas, he noticed the head of a giant snake lying in the water near the bank. He disembarked above the spot and cautiously approached to within half a dozen paces of the beast, whose spotted belly lay partly out of the water. "Its eyes," he wrote, "were as large as plates."

Father Heinz gives us an idea of the titanic strength of such monsters:

> On 27 September 1930, on an arm of water that leads from Lake Maruricana to the Rio Iguarapé, a Brazilian named João Penha was engaged in clearing the bank to make it easier for the turtles to come up and lay their eggs. At a certain moment, behind one of those floating barriers made of plants, tree-trunks and tangled branches, against which steamers of 500 tons often have to battle to force a passage, he saw two green lights.
>
> Penha thought at first that it was some fisherman who was looking for eggs. But suddenly the whole barrier shook for 100 yards. He had to retreat hurriedly for a foaming wave 6 feet high struck the bank. Then he called his two sons, and all three of them saw a snake rising

out of the water pushing the barrier in front of it for a distance of some 300 yards until the narrow arm of water was finally freed of it.

During all this time they could observe at leisure its phosphorescent eyes and the huge teeth of its lower jaw.

Besides these witnesses' accounts there are also two striking photographs of incredible monsters, killed 15 years apart. They were published in a Rio de Janeiro newspaper. Photographs can be faked, so to make quite certain Father Heinz sought out the proprietor of the Bazar Sportivo at Manaos who had developed them both. It may seem odd that both rolls of film should end up in the same shop so many years apart, but Manaos is the largest town on the central Amazon and lies near the confluence of many tributaries to the great river; it is the first really civilised place that anyone coming in from the Amazon basin would reach and it cannot have many shops equipped to develop photographs. At all events the proprietor assured the priest that the negatives had not been retouched.

The officials of the Boundary Commission, who brought the first photograph to be developed in 1933, told him how they had killed the giant snake with a machine-gun. The wounded animal had, it seems, risen up some 30 feet, smashing bushes and even small trees in its fall. Four men had been unable to lift its head.

The second photograph was taken in 1948. The snake, which was said to measure 115 feet in length, crawled ashore and hid in the old fortifications of Fort Abuna in the Guaporé territory. It needed 500 machine-gun bullets to put paid to it. The speed with which bodies decompose in the tropics and the fact that its skin was of no commercial value may explain why it was pushed back in the stream at once.

On the strength of all these reports Hagenbeck asserted that the *sucuriju gigante* was not a myth, and that it might reach a length of 130 feet and a diameter of 2 feet 6 inches; its weight would be 5 tons. Its general colour was dark chestnut, and its belly was spotted with a dirty white. Its eyes were surprisingly large, and their terrifying appearance was increased by their phosphorescence.

There are also signs that giant snakes are found north of the Panama Isthmus. François Poli, a young Frenchman who went out to the West Indies and Lake Nicaragua to study shark-fishing, tells in his exciting but thoroughly factual book, *Sharks are Caught at Night*, how he met a German called Brennecker, who had lived in Nicaragua for 20 years and had met one in the triangle of "disputed territory" between Nicaragua and Honduras.

"I was driving a jeep [Brennecker told him] along a sort of natural track winding between two lines of trees when I saw, about fifty yards ahead, a huge fallen tree-trunk which barred the way. I told the boy who was with me to go and find some way of shifting it. He came back at a run. It wasn't a tree-trunk at all, but a snake. It stirred and began moving slowly towards us. . . ."

There was a silence, and then he added:

"I've seen the most incredible snakes in this country during the past twenty years—and I can assure you that I know how to handle a gun. But that day I left the revolver where it was; I just stepped on the gas and drove off."

Even if we admit that the dimensions of these monsters are very likely to be exaggerated by the alarmed witnesses who saw them, we must also admit that the arguments against their existence are even less reliable. The purely negative attitude of the sceptics who refuse to believe any of these stories, and insist that the witnesses must be liars and the photographs fakes, need hardly be discussed. But there are others who have tried to prove "scientifically" that such monsters are impossible, and this deserves discussion.

A very learned naturalist Louis Marcellin has attacked the legends on mathematical grounds:

> Let us be generous and allow a certain margin to these proportions: 40 to 45 feet as serious authors have supposed without however adducing the beginnings of a proof. We are still a long way from the 130 feet in question and even more from the actual weight of a snake 30 feet long which weighs 250 lbs. Let us allow an average of 9 lbs. per foot. A "monster" of 130 feet would weigh at the maximum half a ton.

M. Marcellin (who incidentally is not so generous as he pretends, since Verrill's 19½-foot snake weighed 360 pounds, an average of nearly 19 pounds per foot) is a poor mathematician. And Dr Jose Candido de Melo has made a similar mistake in asserting that a 5-ton snake would have to be 500 feet long. The weight of a snake would be directly proportional to its length only if its thickness were constant, and no one has been so foolhardy as to pretend that the diameter of a 130-foot snake is the same as that of a 20-foot one. If the proportions of the two are the same the weight depends upon the volume, that is upon the *cube* of the length. Worked out correctly, the weight for M. Marcellin's snake would therefore be just under 7½ tons, and if it had the proportions of Verrill's it would be no less than 45 tons. Both these calculations assume that the proportions of these giant boas are the same as those of smaller snakes. Since Hagenbeck has given us the snake's *diameter* as well as its

length we can go to work another way (calculating for ease of arithmetic in the metric system). His snake is 40 metres (130 feet) long, 80 centimetres (2 feet 6 inches) thick and it weighs 5 metric tons (almost equal to 5 British tons). Now, since it is an aquatic snake, it must, like all other aquatic animals, have a specific gravity almost equal to that of water. In other words, every cubic metre of snake weighs the same as a cubic metre of water: 1 metric ton. Now assuming that it tapers considerably at the tail, and Hagenbeck's 80 cm. is a maximum diameter, let us consider the snake as a cylinder of, say, 50 cm. diameter, i.e. 25 cm. radius. Its weight is then $40 \times 0{\cdot}25^2 \times \pi$, which is about $7\frac{3}{4}$ tons. By the same method we can say that if a perfectly cylindrical 40-metre snake were to weigh 5 tons, its diameter would be 39 cm.

All in all, I think 5 tons a *very reasonable* weight for a 130-foot snake, and I am surprised that the people who shot it and had no means of weighing it at hand were able to judge its weight so accurately.

If this is the normal weight for these monsters it is less surprising that none of the people who claimed to have shot one should have brought back a specimen, or waited until the flesh had rotted off the bones to bring back a bone. In the tropics flesh putrefies quickly, and the stench that would rise from 5 tons of rotting flesh defies the imagination.

Five-ton snakes are not the only monsters reported from this part of the world. The Marquis de Wavrin writes:

> Around the Upper Paraguay they give the name *miñocao* to a more or less fabulous snake; the natives say that it can reach the size of a canoe. They suppose that it is a *sucuriju* or boa-constrictor that has grown very old and turned into a water-snake. On the Upper Rio Parana, in Brazilian territory, I have also been told of these enormous snakes, capable of dragging a canoe to the bottom. These monsters frequent deserted places, and never leave a river. The fear they arouse is quite superstitious.

The *miñocao* or, in its more usual Portuguese spelling, *minhocão*, sounds at first as if it were one of the giant boas we have been discussing, a *sucuriju gigante*. But when we have looked more carefully at the legendary description of the *minhocão* and reports of eye-witnesses who have seen it we shall find that it is neither an anaconda nor a boa-constrictor, and may eventually doubt whether it is a snake at all.

The first scientist to be interested in the *minhocão* was Fritz Müller (1821–97), a German, who, after studying the embryology of certain crustaceans, noted that the various forms the individuals took in the

course of their development corresponded to those their species had taken in the course of its evolution. This novel idea inspired Ernst Haeckel to formulate his famous Recapitulation Theory: ontogenesis reproduces phylogenesis—or, in plainer language, during its life-history an animal climbs up its family tree.

It was in Brazil, where he had gone as a trader, that Fritz Müller spent his spare time studying the development of crustaceans and where he was able to collect numerous tales about the fabulous *minhocão*. At first he took no notice of what seemed absurd stories about an animal 50 yards long and 15 feet across, covered in bony armour, overturning trees like blades of grass, shifting the courses of rivers and turning dry land into fathomless marshes. But gradually he collected evidence from people who claimed to have seen it and spoke of it not as a monster but a very large unknown animal, until he wrote a report on the probable existence in Brazil of a huge amphibious creature. The word *minhocão* was, according to Müller, the superlative of *minhoca* (earthworm), and thus meant "giant earthworm." In the late 1860s it made a very remarkable appearance in the neighbourhood of Lage. Some six miles from the town, a certain Francisco de Amaral Varella who lived in Baguaes saw a strange animal of gigantic size on the banks of the Rio das Caveiras. It was 3 feet thick, but not very long, with a pig's snout, but he couldn't say whether it had any feet. He dared not attack it alone, but when he called his neighbours it lumbered off clumsily, leaving a trail of deep furrows about 3 feet wide before it disappeared into the ground.

Some weeks later, a similar trench which could have been made by the same animal was seen on the other side of Lage, nearly four miles from the first. They followed the animal's track which finally led under the roots of a large pine and then were lost in swampy ground. A German merchant called Friedrich Kelling, then living at Lage, was an eyewitness of this.

Another German, Emil Odebrecht, was surveying a route for a road from Itajahy into the uplands of the province of Santa Catarina, and in a broad, swampy plain intersected by a branch of the Rio Marombas his progress was held up by winding trenches along the course of the stream. They were too wide for him to step across, but not too wide for him to jump them. Thus they were about the same width as Kelling's. At the time he did not know what to make of them, but later attributed them to the *minhocão*.

In January in the early 1860s Antonio José Branco who lived on a

tributary of the Rio dos Cachorros 6 miles from Curitibanos, and had been away with his whole family for eight days, came home to find the road undermined, huge heaps of earth thrown up and a grooved track 10 feet wide and about half a mile long, ending in a swamp. It had turned a stream from its old course. The animal's route was mostly underground, and where it went down under the stream, several pine-trees were overthrown. One of the trees with its bark rubbed off was still to be seen in 1877. Hundreds of people came from Curitibanos and other towns to see the *minhocão*'s work. They thought it must still be in the swampy pool because the water was sometimes suddenly and inexplicably disturbed. On still nights a rumbling noise and faint earth-tremor was heard in the buildings near by. Müller was told this story by two eye-witnesses, Branco's son, José, and his stepson, Crescentio Fernando da Maia who had lived in Branco's house at the time. He remarks that the *minhocão*'s appearance was supposed to presage rain.

One evening in 1849, after a long period of rains, a sound of falling rain was heard in João de Deos's house near the Rio dos Papagaios, a tributary of the Iguassú in Parana province, but the sky was clear and starry. Next morning a large piece of land on the other side of a hillock was completely undermined: deep furrows led to a stony plateau—locally called a *lageado*—where heaps of reddish-white clay showed the route the beast had taken into the bed of a stream that ran into the Papagaios. Three years later a rich landowner called Lebino José dos Santos, who lived at Guarda-môr near Curitibanos, sought out the place, found the tracks still there, and concluded that there had been two animals some 6–10 feet thick.

Senhor Lebino also related that in the same district, a negress, who was going one morning to draw water, found the pool destroyed and saw an animal "as big as a house" crawling away on the ground. She called her neighbours, who arrived too late to see the monster itself, but they saw its track where it had passed over a rock and disappeared into deep water. In the same neighbourhood a young man saw a big pine-tree suddenly fall without visible cause. He hurried up, found the surrounding earth moving and saw a huge worm-like black animal, "no longer than a lasso" (about 80 feet) with two movable horns on its head lying close to its body. It was wallowing in the mud.

Senhor Lebino also told Müller that there was a place called Charquino, or Little Marsh, on the Campo do Tinga not far from the Ypanema in São Paulo province, but a *minhocão* had driven a trench through

it and turned it into a stream running into the Ypanema. The same Senhor Lebino was told near Arapehy in Uruguay that a few miles away one could see a *minhocão* which had got stuck in a crack in the rock and had died. Its skin was supposed to be thicker than the bark of a pine, and to have scales like an armadillo's.

> From all these stories [Müller remarks] it would appear conclusive that in the high district where the Uruguay and the Paranà have their sources, excavations and long trenches are met with, which are undoubtedly the work of some living animal. Generally, if not always, they appear after continued rainy weather, and seem to start from marshes or river-beds, and to enter them again. The accounts as to the size and appearance of the creature are very uncertain. It might be suspected to be a gigantic fish allied to *Lepidosiren* and *Ceratodus;* the "swine's snout," would show some resemblance to *Ceratodus*, while the horns on the body rather point to the front limbs of *Lepidosiren*, if these particulars can be depended upon. In any case it would be worth while to make further investigations about the Minhocão, and, if possible, to capture it for a zoological garden!

Fritz Müller is not the only authority for the *minhocão*, nor is his theory about its identity the only or the most likely one.

The *Gaceta de Nicaragua* of 10 March 1886 published a letter from Paulino Montenegro telling how during a journey to Concordia in February he heard that a gigantic snake had settled in a place called La Cuchilla. He went there with some friends and saw tracks which convinced him of the existence of some large animal. Five years earlier a sort of platform of earth had appeared for no apparent cause at the foot of a hill. A peasant trustingly planted some fruit trees on it, but in 1863 the ground collapsed, laying bare a large rock; yet there was no water to cause the subsidence. Little by little, trees were loosened, great oaks were even overturned, and huge chunks of rock thrown up until in December they barred the road between Chichiguas and San Rafael del Norte. The ground still showed many crevasses and in places it had caved in. It had clearly been undermined. When Montenegro arrived the last track was three days old, and revealed that there had been two animals. The track lay in loose ground, and one could see where the beast had pushed over an oak and then retreated apparently frightened at the crash. Two tracks led from there, one directly into a pool, the other larger one first went over some stony ground, where it was 4 feet deep, and then straight down into the same pool. Roots of trees on the way were worn through and rocks weighing more than a ton and a half had been pushed aside. The animals seemed to have scales from the

imprints they had left in the mud. Montenegro thought they must have been about 40 feet long (but how can one judge *length* from a groove in the ground?), 10 feet high and 5 feet wide. They had been known locally as *sierpe*, serpents.

Fawcett also seems to refer to the *minhocão* when he writes:

> In the Paraguay River there is a freshwater shark, huge but toothless, said to attack men and swallow them if it gets a chance. They talk here of another river monster—fish or beaver—which can in a single night tear out a huge section of river bank. The Indians report the tracks of some gigantic animal in the swamps bordering the river, but allege that it has never been seen. The shark exists beyond doubt;[1] as for the other monsters—well, there are queer things yet to be disclosed in this continent of mystery, and if strange, unclassified insects, reptiles and small mammals can still exist there, mightn't there be a few giant monsters, remnants of an extinct species, still living out their lives in the security of the vast unexplored swamp areas? In the Madidi, in Bolivia, enormous tracks have been found, and Indians there talk of a huge creature described at times half submerged in the swamps.

The reports are usually rather vague about the animal's size and shape. Indeed it has been assumed on too little evidence to be a monstrous earthworm, merely because it leaves grooved tracks like a worm's. It might well have feet concealed below the earth or mud, although no observer mentions them. Dr Budde, who summarises Müller's report in his *Naturwissenschaftliche Plaudereien*, remarks:

> If the animal has no feet, we must allow that it moves by crawling like a worm: its scales would serve to give it a grip when forcing a subterranean passage. The pig's snout and the horns, if they can be trusted, remind one of certain reptiles that lead a similar life to the *minhocão*'s.

This last phrase seems to refer to the horned viper which burrows in the sands of the Sahara and Arabia Deserta. But according to Dr Budde, the *minhocão* could just as well be some kind of gigantic armadillo, one of those alarming living tanks that I have mentioned in the previous chapter. The bony carapace sometimes mentioned, the snub nose and the horns—which are merely the upstanding ears—all recall some kind of Glyptodon. Given that this animal, which had powerful

[1] It has been claimed that sharks sometimes go up the Amazon as far as Manaos, about 1,000 miles from the coast. Zoologists have always treated these reports with great reserve, but early in 1953 Felipe Ancieta of the Peruvian River and Forestry Department published a report and a photograph of a shark of the genus *Carcharinus*—the most voracious type—caught near Iquitos, 2,300 miles from the mouth of the river.

78. Reconstruction of the Glyptodon, a giant armadillo, 12 feet long.

claws, was a burrower like the present armadillos, to which it is related, the picture is in some respects a very good likeness. As it was over 11 feet long the passages it dug must have caused considerable subsidence in the ground. In Africa the burrows dug by the aardvark, a much smaller animal, often make whole slices of road collapse and hold up the traffic. Dr Budde thinks it possible that the *minhocãos* may be survivors of this group which have escaped destruction and the notice of naturalists by their underground habits. And the editor of *Nature*, which also published a version of Müller's report, shares this view.

Only one of the *minhocão*'s habits seems surprising in a Glyptodon: it is amphibious. Armadillos certainly are not, though it is now known that they are excellent swimmers. They cross narrow streams by running across the bottom, and for larger rivers they fill their intestines with air until they float in spite of their heavy armour. There is no reason why a giant armadillo should not take up a semi-aquatic life. It would not be the only mammal to be both a burrower and amphibious: besides the platypus there is the insectivorous water-shrew (*Neomys fodiens*) and rodents like the beaver and the muskrat. Like the giant dinosaurs, such as the Diplodocus, it might have taken to a medium denser than air, where its heavy body, laden with its great carapace, could move more easily. With its scales it could easily be mistaken for a giant snake if only its head and the huge dome, more than 3 feet wide, of its carapace were visible above water. The legends about gigantic reptiles might be due to people seeing Glyptodons and very large water-boas and mixing the two together. More evidence is needed

before one can draw such a bold conclusion, but given the comparatively recent date of the Glyptodons, which have certainly been contemporary with men, their survival would not be so surprising.

Personally I am inclined to think that a third animal may have confused the story. The monstrous water-snakes are so similar to the great sea-serpent—which is certainly not a snake, since it wriggles up and down, and not from side to side—that I wonder whether they may not be primitive Cetacea (Archaeoceti). As Remington Kellogg suggested in 1936 in his *Review of the Archaeoceti*, the first stages in the history of the Cetacea (whales, etc.), which are mammals that have reverted to the sea, may have occurred in freshwater lakes and rivers. Some of the Archaeoceti had a coat of mail consisting of rings of horny scales around the body. The rows of nodules on the skin on some porpoises' backs (genus *Neomeris*) are a vestige of this ancient armour.

If a primitive cetacean had survived today, its head, rising above the surface on a neck as flexible as a seal's, and its scaly back would make it look very like a monstrous serpent. Ivan T. Sanderson no doubt had this in mind when he wrote:

> Perhaps there are Acrodelphids still cruising the oceans, Zeuglodonts browsing in lakes, lochs, and fjords, the ancestors of these in tropical rivers, and even some "First Ancestors" [Archaeoceti] on their banks.

But all this can be no more than a theory, for we know far less about the *minhocão* than about the great sea-serpent or the Loch Ness monster. At all events it is more probable than that the surviving giants should be those dinosaurs that seem to leap into romantic minds whenever they learn of the discovery of huge footprints or glimpses of vast aquatic animals in the Green Continent.

CHAPTER FOURTEEN

Apes in Green Hell

> For mine owne part I saw them not, but I am resolued that so many people did not all combine or forethinke to make the report.
>
> SIR WALTER RALEIGH on the tales of hairy men that he heard in South America.

CANDIDE and Cacambo were lost in the Amazon jungle when they heard faint cries that seemed to be uttered by women.

They could not tell [writes Voltaire] whether they were cries of pain or of joy; but they rose hastily with that alarm and uneasiness caused by everything in an unknown country.

The cries came from two completely naked girls who were running gently along the edge of the plain, while two monkeys pursued them and bit their buttocks. Candide was moved to pity; he had learned to shoot among the Bulgarians and could have brought down a nut from a tree without touching the leaves. He raised his double-barrelled Spanish gun, fired, and killed the two monkeys.

"God be praised, my dear Cacambo, I have delivered these two poor creatures from a great danger; if I committed a sin in killing an Inquisitor and a Jesuit, I have atoned for it by saving the lives of these two girls. Perhaps they are young ladies of quality and this adventure may be of great advantage to us in this country."

He was going on, but his tongue clove to the roof of his mouth when he saw the two girls tenderly kissing the two monkeys, shedding tears on their bodies and filling the air with the most piteous cries.

"I did not expect so much human kindliness," he said at last to Cacambo, who replied:

"You have performed a wonderful masterpiece; you have killed the two lovers of these young ladies."

"Their lovers! Can it be possible? You are jesting at me, Cacambo; how can I believe you?"

"My dear master," replied Cacambo, "you are always surprised at everything; why should you think it so strange that in some countries

there should be monkeys who obtain ladies' favours? They are quarter men, as I am a quarter Spaniard."

"Alas!" replied Candide "I remember to have heard Dr Pangloss say that similar accidents occurred in the past and that these mixtures produce Aigypans, fauns and satyrs; that several eminent persons of antiquity have seen them; but I thought they were fables."

"You ought now to be convinced that it is true," said Cacambo.

The ancient myth that satyrs and fauns were hybrids between men and beasts is now known to have been based on garbled descriptions of anthropoid apes.

Voltaire was of course more interested in the women's behaviour than the monkeys' existence. All the same he garnished *Candide* with fact wherever possible. What made him think that there were large apes in South America when in fact the only species of monkeys there known to science are small and have long tails? One cannot be certain, but it is more than likely that he drew his information chiefly from the memoirs of those Jesuit missionaries whom he so loved to make fun of. The *Noticias Curiosas e Necesarias das Cosas do Brasil* by Father Simão de Vasconcellos, S.J., provincial of Brazil, is a mine of curious information and contains several references to man-faced monsters that haunted the Brazilian forests. There are, for instance, dwarfs called *goazis* or *guayazis*; the *matuyús*, wild men with their feet the wrong way round; *curinquéans*, giants 16 spans (about 11 feet) high, the most courageous of creatures, with their lips and nostrils adorned with nuggets of gold, for whom everyone showed the greatest respect.

These legends are so like those which had been known in the East since time immemorial that one might easily suppose that the first explorers, who thought they had arrived in Asia, had innocently fathered on the new continent the wonders that Ctesias and Megasthenes had reported of the Indies; in which case it would hardly be surprising that the legend of Indians who coupled with beasts "under the influence of a vile sensuality" should also be found in America.

But subsequent explorations showed that it was not the Conquistadors who had introduced these tales; they were current among the most remote tribes which had had no contact with the whites. Moreover, most of them had a foundation in fact. The first reports about the New World therefore deserve careful attention. During their discovery of the "Empire of Guiana" in 1595 and 1596 Sir Walter Raleigh and his continuator Laurence Keymis heard tell of monstrous creatures reminiscent of the "Aigypans, fauns and satyrs" of the Old World. And of

course at this time, long before the idea of evolution was dreamt of, any animal whose characteristics were a mixture of those of two known animals—in this case man and the ape—were thought to be monstrous crossbreeds, as can be seen from the following passage from the Spanish historian Pedro de Cieza de Leon's *Crónica del Perú*:

> It is also said that in other places there are (though for myself I have not seen them) very large long-tailed monkeys which live in the trees and which the natives (tempted by the devil who seeks to find where and how he can make man commit the vilest sins) use like women and, it is affirmed, some of these monkeys are supposed to give birth to monsters which have a man's head and privy parts and a monkey's hands and feet. They have, it is said, a thin body, and a great stature. They are hairy. Indeed they resemble (if it is true they exist) the devil their father. It is also said that they have no language but a plaintive moan or howl.

Some such story as this must have been the origin of the incident in *Candide*.

Rumours of large apes, like the chimpanzee or the gorilla, have persistently come from South America, and sometimes significantly from remote places where they could not have been introduced from Europe. In 1769 Dr Edward Bancroft brought from the heart of Guiana a report about an "orang-utan"

> much larger than either the *African* [the chimpanzee] or *Oriental*, if the accounts of the natives may be relied on. . . . They are represented by the *Indians* as being near five feet in height, maintaining an erect position, and having a human form, thinly covered with short black hair; but I suspect that their height has been augmented by the fears of the *Indians*, who greatly dread them. . . .

When, some 30 years later, Alexander von Humboldt reached the still-unexplored rapids of the Upper Orinoco, he heard tell of "a hairy man of the woods" which was reputed to build huts, carry off women and eat human flesh. The Indians of the region, and even the missionaries in the neighbouring country, believed that this animal existed and called it *vasitri* or "big devil." The alleged habits of this lascivious beast remind one of those attributed to the gorilla, which, however, was still utterly unknown in Europe. According to Humboldt this fable could be based on "one of those large bears, the footsteps of which resemble those of a man and which are believed in every country to attack women." In 1860 Philip H. Gosse pertinently asked what "large bear" could inhabit Venezuela, for the only known South American bear is of very modest size. "Is not such a bear in South America quite

as gratuitous as the monkey himself?" Rejecting Humboldt's explanation as unconvincing, Gosse affirms that it is possible that in South America "there may exist a large anthropoid ape, not yet recognised by zoologists"—a prophetic phrase, as we shall see. And today there is no lack of rumours about fantastic man-faced monsters in the Green Continent, much of which is still little known. Frank W. Lane writes

> Gold prospectors, working on the River Araguaya, which flows near the Matto Grosso, have heard roars coming from the depths of the virgin forest. Cattle have been found dead and every time their tongues had been wrenched out by the roots. Two prospectors have seen footprints in soft sand by the river, which resembled those of a man, but were 21 inches long.

Henri Pitaud, director of the Sociedad de Estudios y Empresas Franco-Paraguaya of Asuncion, told me in 1955 that a similar event had caused a sensation in the Ybitimi region in Paraguay a few years before.

> In an *estancia* about a hundred cattle were found dead without any wounds except that the tongue was torn out and gone. This went on for nearly eight months. Everything returned to normal, then, suddenly, two or three years ago, the same events recurred in the same area but in a different *estancia*: another hundred cattle suffered the same fate.

As to the large footprints, these are puzzling enough without even invoking such legendary monsters as the *curinquéans* and the *vasitris*, for though human-looking tracks may be made by an ape, a bear or even a large reptile, in this area there is no known animal that leaves footprints 21 inches long. In fact they can only be attributed to certain prehistoric (or supposedly prehistoric) animals, such as the Megatherium or a dinosaur *Prestosuchus chiniquensis*, whose remains have been found in Brazil and whose footprints looked as if they had been made by enormous human hands.

But this could not explain the torn-out tongues, for surely it needs a true hand to grasp a cow's tongue, and extraordinary strength to succeed in ripping it out. Must it not *really* be some kind of ogre? The idea is so fantastic that it is hard to take seriously, but since there is now proof that more or less human-looking giants once inhabited a large part of the earth and may still survive in the Himalayas, it is impossible to banish this nightmarish notion.

It would indeed be odd if the vast basins of the Amazon and the Orinoco did not still hold several surprises for the zoologist, but so far most of the evidence about unknown animals there comes from isolated wit-

nesses and for lack of confirmation is not accepted by serious naturalists. There is one great exception: the large ape, very human in appearance, which has been met several times and has even been photographed, though its identity is still in dispute.

In 1917 François de Loys, a Swiss geologist, set off with a handful of men deep into the Sierra de Perijaá, a range of mountains covered with impenetrable virgin forests, which lie astride the borders of Colombia and Venezuela and are inhabited by the dangerous Motilone Indians. The expedition went on for three years. It was an exhausted party of men, decimated by fever and skirmishes with the savages, who in 1920 were in the forests along the River Tarra, a tributary of the Rio Catatumbo, south-west of the lagoon of Maracaibo.

79. Capuchin monkey, a typical Platyrrhinian monkey (with splayed nostrils) of the New World.

There, not far from the river, Loys and his companions suddenly met two tall monkeys which advanced towards them, walking upright and holding on to bushes. They seemed to be beside themselves with rage, screaming, waving and tearing off branches and brandishing them like weapons. At last they reached such a pitch of fury that they defecated into their hands and hurled their excrement at the intruders. Loys and his companions aimed their guns at the male, who was in front and was the most threatening of the two, but he stepped aside and let the female pass. It was she who was killed by the salvo from the guns. Whereupon the male fled. The dead animal was then carried to the river bank, seated on a petrol-crate and held upright by a stick under its chin. In this position it was photographed (see frontispiece).

Professor Georges Montandon, to whom Loys reported the incident and who informed the learned world of it, points out that this monkey was "an utterly new apparition to the Creoles who accompanied the leaders of the expedition, though not perhaps to the Motilone savages."

What was this large monkey? At first glance the only photograph we have of it reminds one irresistibly of a spider-monkey, but with a strikingly human expression on its face—more human than that of any anthropoid ape. The nostrils are very wide apart, separated by a broad wall of cartilage: it is thus a Platyrrhinian, like all the other American monkeys. As Professor Joleaud has remarked, its face shows features typical of the spider-monkeys, for instance:

> In the general arrangement of the ocular region, where the eye-socket cavity is surrounded by a projection of bone which is almost equally prominent everywhere and is carried on just as markedly across the cheekbones as in the eyebrows.

The thumbs of its hands are extremely small—also a characteristic of the spider-monkeys. The genitals (which are not a penis but a clitoris, for it is indeed a female) are strikingly large. All female spider-monkeys have an over-developed clitoris, and though it has often been said that in Loys's monkey it was even more exaggerated, I have seen for myself by examining a black spider-monkey in Antwerp Zoo and several other living specimens, that it was not. I also noticed that it has a deep groove on the rear side, down which the urine runs, thus increasing the resemblance.

80. Spider-monkey of Brazil.

This anatomical peculiarity may be the origin of the South American legend that apes couple with women. Since all the spider-monkeys seemed to be males, their mates would have to be of another species: Indian women. The bastards supposed to be born of these bestial amours are called *coatás-tapuyas*, *coatá* being the Brazilian name for spider-monkey.

Had Loys's monkey merely been a spider-monkey—as many of its features suggest (to say nothing of the habit, frequent among these beasts, of hurling its excrement at its enemies)—he would hardly have gone to the trouble at such a critical moment of his explorations to photograph such a common animal. Besides, if he is to be believed, the

monkey in question was far larger and more massive than any spider-monkey he had ever seen, and it had no tail. All the spider-monkeys have tails—and what is more they are long and prehensile.

This absence of tail, a feature in common with the African and Asian anthropoid apes, is, alas, not visible in the photograph. On the other hand, it is hard to deny that Loys's monkey has a more massive body and thicker limbs than the ordinary spider-monkeys. A detail which I do not think has been pointed out is that its thorax seems to be flattened dorso-ventrally, like an anthropoid's—as one can see from its broader shoulders—and it is much longer than a spider-monkey's. Its face is also much more oval. Its hind-legs seem to be shorter than its fore-legs, like those of the anthropoids, but this is not enough to put it into a different genus; all the spider-monkeys have a similar tendency.

There is one other very important characteristic in which the Platyrrhinian monkeys of the New World differ from the Catarrhinians of the Old World. The former have 36 teeth, the latter 32. Loys asserts that the animal he shot had only 32. We cannot verify this figure without examining the monkey's dentition in detail. Alas, the expedition's cook who prepared and preserved the animal's skull was rash enough to turn it into a salt-box. It dried and disintegrated in the heat and little by little the pieces were lost.

If Loys has given the number of teeth correctly, the monkey might still have a Platyrrhinian's normal dentition, if the last molars had not yet appeared, though this would be most extraordinary in an apparently adult animal. It would have to be a freakish reduction in the basic number, which, as Dr Charles Bennejeant has pointed out, is extremely rare: the American monkeys are more apt to increase the number of their molars. Nevertheless, in an unpublished treatise quoted by Professor Beccari, Dr Schultz of Baltimore, who collected some 400 specimens of monkeys in Nicaragua and Panama, has shown that the spider-monkeys are an exception to this rule and often lack the third molar.

If Loys's ape is, as it seems, a highly developed spider-monkey, one would expect that what is a tendency in the rest of the group would be a normal characteristic for it, in which case de Loys was telling the truth, and we should be all the more inclined to trust the rest of his account, especially about the absence of tail.

There remains its size. The largest American monkeys, howlers, spider-monkeys and woolly spider-monkeys, are no more than 3 feet 7 inches high when they stand up on their hind-legs. Loys swears his monkey was much larger. At first, relying on his memory, he gave a

height of 4 feet 5 inches, but later he found a note he had sent home to his mother giving the exact dimensions: 1 metre and 57 centimetres—5 feet $1\frac{3}{4}$ inches. So large an American monkey would be an animal quite new to science (though it agrees exactly with the native tales reported by Dr Bancroft), and the sceptics at once began to call Loys's assertions in question and to dispute his measurements. But the probable size of the petrol-crate will determine the animal's size fairly accurately, as was demonstrated at the session of the Académie des Sciences at Paris on 11 March 1929, at which the "monkey of anthropoid appearance" described by Professor Montandon was presented.

> According to M. Cintract, a photographer, who judged from the number of planks in the crate, it must have been about 20 inches high, and the animal's height was between 5 feet and 5 feet 3 inches. On the other hand the standard size for petrol-crates is $17\frac{3}{4}$ inches high, and as the animal is three and a third times the height of the case, this implies a height of 5 feet.

Which confirms the accuracy of Loys's measurements. The monkey would therefore be taller than the chimpanzee, the female of which rarely exceeds 4 feet 3 inches in height. No wonder Loys was so surprised. On the strength of this photograph and information given him by the geologist, Professor Montandon published a careful description of the unknown animal in 1929, naming it *Ameranthropoides loysi*, to mark its anthropoid characteristics and honour its discoverer. Gosse's prediction had come true.

This talk of an American "anthropoid" shocked some zoologists who wanted to keep this term strictly to a few of the Catarrhinians. Actually it has no precise meaning in systematic classification, but is generally used to embrace two distinct families, the Hylobatidae or gibbons and the Anthropoidae (or Pongidae) the gorilla, the chimpanzee and the orang-utan. To my mind the family of Anthropoidae is by no means homogeneous: in some characteristics the orang-utan is nearer to the gibbons—which are Asians like itself—than to the African chimpanzee and gorilla. I am very tempted to believe that the gibbons and orang-utans are giant types derived from the Asian langurs, while the gorilla and chimpanzee have sprung from a group of little African monkeys related to the baboons. Thus the term "anthropoid" merely means all the large tailless apes with arms longer than the legs and a flattened chest, irrespective of their origin. These characteristics betray a special form of locomotion: *brachiation*, that is to say moving usually by swinging from their arms (the other monkeys which employ *cruriation*, or

The spider-monkey is undoubtedly like *Ameranthropoides loysi*, but it is much smaller and has a long prehensile tail.

The Berezovka mammoth reconstructed in the Leningrad Museum as it was found, with the trunk partly eaten by wolves. The fur is original.

Mammoths' tusks brought from the Liakhov islands to a trading post in Yakutsk. This trade goes back to the earliest times.

ordinary quadruped gait, have legs longer than their arms, and the thorax is deeper). Therefore if there is an American ape, descended from the spider-monkeys and showing all these characteristics, there is no reason for not calling it an anthropoid.

To his description of *Ameranthropoides loysi*, Dr Montandon appended two curious documents which showed that large monkeys were not utterly unknown in America. The first was the passage from Pedro de Cieza de Leon which I have already quoted and which applies very well to de Loys's monkey. The second is an account in the American *Science News Letter* of archaeological discoveries made in the peninsula of Yucatan in Mexico:

> Monstrous stone statues like gorillas, coming from the gorilla-less country of the Mayas, are one of the unexplained curiosities of the archaeological and historical Museum of Merida (Yucatan). There are two of these creatures without legs, but standing upright more than five feet high on the stumps of their thighs . . . they were found near the town of Tekax in Yucatan. . . . One of these statues seems to be bisexual, for although it has male features, it carries a child on its left arm, like a mother. The figures have a strikingly apelike position. They have pronounced eyebrows, broad chests and a bent back. There is no trace of any legend which explains their significance, and the inhabitants of Tekax know only that these stone statues have been for a long time in their lonely position on the hill. (Emma Reh Stevenson.) [1]

Professor Montandon also remarks that according to the Indians, pygmies still live in the Motilone area. He thinks that these "little men" might very well be large apes, especially if they had particularly human features and sometimes walked upright on the ground. But this theory must be rejected, since the Marquis de Wavrin has shown that these pygmies really are men. He lived for a long time among these 5-foot Marakshitos and returned with a wealth of photographs and films of them. Thus we see that the legend of those dwarfs the *guayazis* is by no means far-fetched. Montandon goes on to make higher claims:

> If our subject's well-developed forehead is not merely the result of an optical illusion, it is not impossible that this creature is a new genus of the Hominidae which would put it on a level with the genus *Pithecanthropus*.

All the same it would be absurd to consider *Ameranthropoides* as a sort of "Missing Link" between monkeys and man, not so much for the

[1] This passage has been retranslated from Professor Montandon's French text, since I have been unable to find a copy of this issue of the *Science News Letter* (Translator's note).

palaeogeographical reasons which lead most anthropologists to rule out America as a possible cradle of mankind, but because the hypothetical common ancestors of men and monkeys belong to a very early period in the history of the primates.

Even so, we may still consider Loys's monkey as a primate, which has developed by convergence as many human traits as the Pithecanthropus of Java or his cousin the Sinanthropus of Pekin. This was the late Professor Leonce Joleaud's view:

> I see the new monkey discovered on the Rio Tarra taking its place in the world of the Cebidae and in particular of the spider-monkeys, in a position determined by a stage of evolution comparable to that of the Pithecanthropus in relation to the group of gibbons.

It is now known that in the Sinanthropus, which was no doubt a variety of the Pithecanthropus, "the jaw was," in Professor C. Arambourg's words, "strongly prognathous, the nose platyrrhinian, and that altogether it had a pronounced pithecoid appearance." So it is hardly surprising that there should be such a striking resemblance between the

81. Comparison of the shape and structure of the face of the Ameranthropoid (shown here with its mouth shut) and the Pithecanthropus (after an unduly humanised reconstruction by von Koenigswald, 1938).

Ameranthropoid and a reconstruction of the Pithecanthropus made by von Koenigswald in 1938, even though he has humanised it unduly. The bare skin, hair only on the head and eyebrows, lips, sclerotic visible in the eyes—all these are features which cannot be inferred from the bones alone, and must therefore have been invented. If you disregard them you will see that the shape of the face is the same in the two. Indeed it is very possible that the Pithecanthropus looked more like Loys's monkey than like the suspiciously humanised reconstruction of it.

On the other hand, the Ameranthropoid's face is clearly different from

that of an ordinary spider-monkey's. It is oval in outline instead of being rather triangular. The bottom of its face is much heavier, and its jaws are more powerful. And though it has been photographed full face, one can see that its profile is more like that of a capuchin monkey, another smaller American species, than like a spider-monkey's, in which the upper jaw recedes sharply, giving it a fairly pointed snout, while the capuchin's is more rounded. No doubt Loys's monkey has a similarly slight prognathism.

82. Comparison of the profile of a spider-monkey (*above*) and a capuchin (*below*).

It would be extremely interesting to know the Ameranthropoid's cranial capacity. If the development of its brain has reached the same level as the Java ape-man's, its habits and psychology would be a fascinating study. The best-preserved Pithecanthropus skull (skull II) has a capacity of 775 cc., between the gorilla (600 cc. average) and a modern European (1,320 cc. average). The Sinanthropus, though so similar to the Java ape-man, is better off with an average of about 1,040 cc.

The cranial capacity is the only evidence from which the anthropologist can judge a mammal's cerebral development, and it has to be considered not absolutely (since an elephant's brain weighs four times as much as a man's and a whale's five times as much), but relatively to the weight of the body as a whole. Even so, a man's brain is only one forty-sixth of his total weight, whereas a capuchin's or a spider-monkey's brain is between one fifteenth and one seventeenth. But as man is undeniably more intelligent than these monkeys, all sorts of formulae have been invented, with varying degrees of success, to calculate a "cephalisation index" which will give man his pre-eminent place. The weight of the brain and the body are always the main factors, but many authors also take into account the height. Be that as it may, the cerebral

development of the monkeys of the New World, as regards both weight and height, is much more remarkable than that of those of the Old World, even including the anthropoid apes. And as Bierens de Haan, the Dutch psychologist, has proved, the intelligence of the capuchin monkey, even though it is no bigger than a small cat, can very well be compared to that of the remarkably intelligent chimpanzee.

If, as in the African and Asian monkeys, the intelligence of the American monkeys is very roughly proportional to their size, the Ameranthropoid's intellectual faculties must be much higher than those of the chimpanzee or gorilla. Even if it is merely a giant spider-monkey, its cranial capacity would be much larger than theirs. No doubt it is larger than the Pithecanthropus's and perhaps even than man's. If a spider-monkey or a capuchin kept its usual proportions but were as large as a man it would obviously have a larger brain than his; and the Ameranthropoid (5 feet 1¾ inches) is the height of a human pygmy (5 feet or less) or even a short man. Even though it certainly has an intellect far inferior to the most backward of men (otherwise it would have conquered the world!), a comparative study of its anatomy and physiology, especially that of its brain, with those of a man of the same size would be of immense interest and might enable us to establish for certain the relation between the weight, volume and shape of the brain and the degree of intelligence.

The zoological problem of Loys's monkey demands a solution. Some eminent naturalists, like Sir Arthur Keith, have coolly avoided the issue by maintaining that it is merely a variety of ordinary spider-monkey and that the tail has been hidden in the photograph—thus implying that Loys is a fraud. Quite apart from the size of the animal—which can still be disputed, though unfairly—it seems to me that the photograph proves that this is an unknown kind of monkey, and I am forced to the irreverent conclusion that Sir Arthur has never had a good look at an ordinary spider-monkey. Philip Hershkovitz, an excellent American mammalogist who during the War prospected the area that Loys had explored but found no trace of the Ameranthropoid, even claims to have determined the species of spider-monkey to which it belongs, the mulatto spider-monkey (*Ateles hybridus*). I therefore spent a long time in the Natural History Museum in Paris studying the "type" of this species, collected by Le Plée in Colombia in 1826, but I was not in the least convinced. While it is true that the mulatto spider-monkey has much thicker limbs than the other spider-monkeys (at least it had

in this specimen which had been mounted from a skin in poor condition) and fur not unlike the Ameranthropoid's, its size, the length of its thorax and more especially the shape of its face quite refuted this identification.

Legends of large monkeys are not confined to the Colombo–Venezuelan border, but are found all over the country of the Amazon. The Marquis de Wavrin writes:

> I have been told of the existence of large monkeys in the region of the vast forest north of the Matto Grosso, between the Paraguay and the Amazon basins. I have not seen them. Although large monkeys are reported everywhere in the Amazon basin, if relatively rarely, it is around the Orinoco that they seem to be more frequent. They are called *maribundas*. Their height when standing upright, a position they readily adopt to walk on the ground, is supposed to be about 5 feet. The only civilised man who lives with his family on the Guaviare on the upper reaches of this river, told me he had brought up a young *maribunda* at his house. It was very friendly and amusing in all its pranks; finally its owner had to kill it because it did too much damage.
>
> The *maribunda*'s cry sounds strangely like a human call. On the Guaviare in particular I several times thought at first that it was Indians calling.

Once *maribundas* spread panic among his servants, who thought they were being attacked by the terrible Guaharibo Indians. Are these *maribundas* the same as Loys's monkey? I think not. In fact *maribunda* or *marimonda* is the native name for what in English is called the marimonda spider-monkey (*Ateles belzebuth*)—but this is never more than 3 feet 7 inches high. And Wavrin adds: "According to what the Indians told me, this monkey's body is rather slim. It likewise has a prehensile tail"—which does not agree at all with Loys's description. Rather than suppose that there is a giant species of marimonda spider-monkey, might there not be a confusion in the Indians' minds between a marimonda of ordinary size and our large tailless spider-monkey which according to Loys is greyish brown? In any case the Marquis de Wavrin's observations are far from solving the problem.

At first sight Roger Courteville's evidence appears more helpful. A civil engineer who once led an ethnographic expedition in South America, he was, in 1926, the first man to cross the entire continent, from Rio de Janeiro to La Paz and Lima, by car. He claims that in the area that Loys explored he twice met a large tailless ape. He informs me that his encounters occurred in 1938 and 1947. In his book *Les Indiens Inconnus de l'Amazonie* he tells how he was in virgin forest

between the Rio Catatumbo and the Rio Tamandua Bandeira, a tributary of the Rio Aiquaissa, not far from the Colombo–Venezuelan frontier.

> Only a few yards away, a creature resembling an Indian of unknown race, stared at me with a vacant eye. A prominent brow overhung its very soft grey-blue eyes. A dark hairless face rose above its receding chin. It had a tuft of thick hair on the crown of its forehead; a powerful neck towered above its broad V-shaped thorax; long reddish hair covered its limbs and body. Its bestial appearance contrasted, however, with its peaceful attitude.
>
> Was it a man? Was it a monkey? It seemed rather a monstrous hybrid of the two, a creature born of the unspeakable amours of an Indian woman and a spider-monkey. Its upper arms seemed longer than its forearms, just as its thighs seemed longer than its shins. The footprints left in the fine sand showed me that it walked on the outside edge of its feet, as the chimpanzees do.
>
> Protected by the bowie-knife fastened to my belt which would be a great help to me in the event of a hand to hand struggle with those unusually muscular arms, I rose gently from my crouching position, without taking my eyes off the Pithecanthropus for a moment. Slowly I approached it.
>
> Its restless eyes did not stop rolling from side to side without daring to look directly into mine. When I was two yards away from it, its upper lip drew back, exposing its incisors and the edge of its gum.
>
> Suddenly in one leap backwards it disappeared with disconcerting rapidity into the shadow of the forest. The branches and underbrush closed after it as if to hide its flight.
>
> The apparition had not lasted a minute. But I think that I shall never forget it as long as I live.

He knew of Loys's monkey, and recognised that his "Pithecanthropus" was the same creature. As a result of an article he published in *Caliban* in May 1951 I wrote to him for additional information. He was positive it had no tail, otherwise how could he have mistaken it for an Indian? He also told me that "the Indian tribes on the frontiers of Brazil, Colombia and Venezuela, including the Ningueno tribe, know these creatures and call them by the onomatopoeic name of *oûuahi*."

This name, which seems to be derived from the animal's cry, is strangely like that of the uakari (*Cacajao*), a little monkey, normally no bigger than a cat, which lives on the Upper Amazon and has a rudimentary almost non-existent tail 4 or 5 inches long. There are many species, the best known being the bald, the red and the black-faced uakaris. Their sad expression is always very human and their bodies are covered with long hair varying from silvery-white to reddish-brown

83. The uakari, a South-American short-tailed monkey.

according to the species. E. G. Boulenger, for many years Director of the Aquarium at the London Zoo, writes:

> The monkey's chief glory is its face which is of a scarlet or brick-red hue, and glows as though illuminated from within.

Its appearance, combined with the apparent absence of tail, is so striking that Boulenger, who does not know Loys's photo, thinks that the "enormous tailless ape" which attacked him was one of these tiny uakaris and that "large specimens of both sakis and uakaris" may be the origin of "the many Indian legends of an unidentified semi-human animal believed to haunt the depths of the Amazon jungle." May not Courteville's Indians have suffered the same confusion as Boulenger? It shows once again how many different creatures may make the identification of an unknown or little-known animal so difficult.

In his book, Courteville also reveals that "in 1938, Dr de Barle met another of these ape-men in the same area and this discovery was the

subject of an official paper." Although I have written at length both to Courteville and to Dr de Barle I can find no trace of this paper. Courteville's circumstantial account does not, alas, help to confirm Loys's description. He has a perfect right to maintain that his "Pithecanthropus" is an "intermediate stage between monkey and man" or even "a hybrid arising from a monkey mating with an Indian woman, or of certain primitive men living in a state of nature mating with a female monkey"—though to me they both seem wild hypotheses. But he has no business to publish in his book a photograph of his "Pithecanthropus" waving its arms among the branches, with the caption "Dr de Barle's document," when this is obviously a crude fake. Loys's photograph has been cut up, its limbs rearranged into a threatening posture and the whole thing stuck on a background of virgin forest, thus leading the innocent reader to believe that the animal has been photographed a second time and in a position in which the absence of its tail is indisputable. Science cannot tolerate such a mischievous act.

What are we to say of the sketch of the "Pithecanthropus" which Courteville drew on brown paper to "fix my impression of the encounter" except that it seems peculiarly suspect? It shows a creature more like a young gorilla than *Ameranthropoides loysi*, which, like the other American monkeys, does not have its brows in a straight line, nor nipples so low as a man's or an anthropoid ape's (they are almost under the armpits), and certainly not human lips. He says that the shape of its footprints indicated that it "walked on the outside edge of its feet, as the chimpanzees do." But in fact the spider-monkeys (and the Ameranthropoid had a spider-monkey's feet) put the whole sole of the foot flat on the ground, just as a man does.

It is quite possible that Courteville really met an Ameranthropoid, as he says he did, but because he has attempted to bolster up his story with suspect details, he cannot be trusted. Which is a great pity. I fear that his picture of the animal is chiefly based on what he had read about it. If he had not read Professor Montandon's article, which quotes Pedro de Cieza de Leon, refers to the Yucatan "pseudo-gorillas" and compares the Ameranthropoid with the Pithecanthropus, would he ever have thought that it was a cross between a monkey and an Indian woman, given it a gorilla's features and called it Pithecanthropus? I hardly think so.

This suspect evidence must not be allowed to cast suspicion on Loys's account, which is supported by an indisputable *document* in the correct sense of the word.

This great ape appears not to be confined to a narrow strip in the north-west of South America. In 1868, a century after Dr Bancroft, Charles Barrington Brown, who was then Government Surveyor in British Guiana, heard new rumours on the Upper Mazaruni on the Venezuelan frontier that a sort of hairy men lived there. Oddly enough, it was after hearing the "plaintive moan or howl" which Cieza de Leon also alleged these ape-men made.

> The first night after leaving Peaimah we heard a long, loud, and most melancholy whistle, proceeding from the direction of the depths of the forest, at which some of the men exclaimed, in an awed tone of voice, "The Didi." Two or three times the whistle was repeated, sounding like that made by a human being, beginning in a high key and dying slowly and gradually away in a low one. . . .
>
> The "Didi" is said by the Indians to be a short, thick set, and powerful wild man, whose body is covered with hair, and who lives in the forest. A belief in the existence of this fabulous creature is universal over the whole of British, Venezuelan and Brazilian Guiana. On the Demerara river, some years after this, I met a half-bred woodcutter, who related an encounter that he had with two Didi—a male and a female—in which he successfully resisted their attacks with his axe. In the fray, he stated that he was a good deal scratched.

In 1931 Professor Nello Beccari, an Italian anthropologist, Dr Renzo Giglioli and Ugo Ignesti, made an expedition to British Guiana, where one of their secondary objects was to attack the problem of Loys's ape. For in this area the fauna, flora, climate and indeed the whole ecological pattern—what is now called the "biotope"—are the same as in the Sierra de Perijaá; and Beccari had read in Elisée Reclus's geographical encyclopedia that according to Indian legend the forests in British Guiana were haunted by fabulous hairy men called *di-di*, which all the Indians fear, although they have never seen them. But it was not until he was just about to return to Italy that he heard any definite information about where this beast lived.

On his return from several months in the interior, he met the British Resident Magistrate, Mr Haines, who was then living on the Rupununi. Haines told him that he had come upon a couple of *di-di* many years before when he was prospecting for gold. In 1910 he was going through the forest along the Konawaruk, a tributary which joins the Essequibo just above its junction with the Potaro, when he suddenly came upon two strange creatures, which stood up on their hind-feet when they saw him. They had human features but were entirely covered with reddish-brown fur. Haines was unarmed and did not know what he could do if

the encounter took a turn for the worse, but the two creatures retreated slowly and disappeared into the forest without once taking their eyes off him. When he had recovered from his surprise he realised that they were unknown apes and recalled the legend of the *di-di* which he had been told by the Indians with whom he had lived for many years.

When Miegam, the guide of the Italian expedition, heard this story he remembered that he had had a similar adventure in 1918. He was going up the Berbice with three men, Orella, Gibbs and an American whose name he had forgotten. A little beyond Mambaca they saw on a sandy beach on the river-bank two creatures which from a distance they took for men, and hailed them to ask if the fishing was good. The unknown creatures did not reply but merely slunk away into the forest. The four men were puzzled and landed on the beach, where they were staggered to find that the footprints were apes' not men's. Miegam could not say whether the creatures had a tail, but it could hardly have been conspicuous, or he would not have mistaken them for men. He did, however, say that two other settlers called Melville and Klawstky had similar adventures in other places.

Professor Beccari obtained further information about the *di-di* from an old negro at Mackenzie, famed for his wisdom, learning and experience. Everyone on the banks of the Demerara called him "Oncle Brun"—presumably he had come from French Guiana or the French West Indies—but the few Indians that survived in the neighbourhood respected him so much they nicknamed him "The Governor." "Oncle Brun" had been told by the Indians that the *di-di* lived in pairs and that it was extremely dangerous to kill one of them, for the other would inevitably revenge its mate by coming at night and strangling its murderer in his hammock. Beccari did not trust the more fanciful part of this story, but felt that it must have a kernel of truth. Loys, like Haines and Miegam, had also met a pair, and so had Barrington Brown's woodcutter. Most South American monkeys live in largish troops, and this habit alone suggests that this is a very peculiar species.

The only difference between the Perijaá ape and those described in Guiana is in the colour of the fur, the first being greyish brown and the second reddish. "Assuming Haines and Loys both described the colour with scrupulous exactitude," Professor Beccari observes, "we may think the Guiana ape is a distinct variety of the Venezuelan species, or even a different but closely related species." He adds that orang-utans vary in colour from a dark mahogany to a bright foxy red, though nobody yet

knows whether they belong to different races or species, or whether they are merely individual variations.

In Brazil the tales of a large manlike ape sometimes become quite fantastic. They are not found in the north of the country near Venezuela and Guiana—the Ameranthropoid's alleged home—but in the south-west in the provinces of Amazonas, Matto Grosso, and Goyaz as well as Acre and Guaporé on the frontiers of Bolivia. The creature has various names: *mapinguary*, *pelobo* and *pe de garrafa* or bottle-foot, for it leaves footprints that look as if they were made by sticking the bottom of a bottle in the ground. Its tracks are always regularly spaced and exactly aligned.

I need hardly say that the attempt to imagine what creature could leave such extraordinary footprints has produced some bizarre results. This is how it was described in about 1954 to Rui Prado Mendonça, Jr., a Brazilian hunter, by one of the oldest inhabitants of the Upper Araguaya:

> It is an animal of a fair height, distinctly human-looking, with long flowing hair on its head, and it has only one leg, with which it makes enormous leaps, always leaving a track of deep prints like the bottom of a bottle. Hence its name. As it has only one leg it cannot walk like other animals, but always stands erect. It is extremely savage and never crosses obstacles in its path. It always goes round them, and is therefore reputed to move in endless zig-zags. When it meets an enemy it fixed him with its eyes with such intensity that the victim is quite hypnotised and falls unresisting into its claws.

It is hardly surprising that this monster terrified even such a brave jaguar-hunter as the old half-breed who told this tale.

He also told Prado Mendonça that several years earlier a flood swept the banks of the Araguaya, spreading panic among the wild beasts. Many of them came and sheltered on rising ground near the half-breed's village. When he went to round up some stray cattle he found hundreds of footprints very clearly marked in the moist ground. They were strange round holes that looked as if they were made with the bottom of a bottle. A *pe de garrafa* had been that way! Now was the time to solve the mystery about this beast. The bravest men in the village set off at dawn, with their guns ready and their knives sharpened, towards the place where the tracks had been seen. The tracks led from the plain towards thick jungle in the heart of which lay a huge lake. To begin with the footprints lay in a straight line, but at the first trees they began

to wind about, as if the creature was keeping well away from every obstacle. The legend was confirmed.

Little by little as the village was left farther behind the men grew more and more frightened, until the moment when their dogs stood stock-still in terror refusing to go any farther. Everything in the forest was silent. Then suddenly a terrible roar rang through the forest and the terrified men took to their heels. Even the boldest of hunters was not ashamed to admit he was afraid of the *pe de garrafa*.

There is not the slightest doubt that tracks which look as if they were made with the bottom of a bottle do exist. They have been seen by witnesses whose veracity is above suspicion, among them Francisco Meirelles who pacified the Chavante Indians.[1] He thought that the track attributed by the Chavantes to the *mapinguary* was made by a deer with a broken leg, though it is hard to see how a limping animal could have left such a regular track, or indeed how anything short of a race of three-legged deer could have accounted for all the tracks of the *pe de garrafa* seen in the Amazon jungle.

These tales may seem too far-fetched and far from home, but a hundred years ago a similar phenomenon in England gave rise to even more fantastic legends. On the morning of 8 February 1855 tracks very like a *pe de garrafa*'s were found in the snow around no less than 18 towns and villages in Devon. They were almost circular, or rather horseshoe-shaped, and in perfectly straight lines. But this beast did not seem to be afraid of obstacles, there were footprints everywhere, on roofs, the tops of walls, in walled gardens as well as open fields, and on both sides of the Exe estuary. The beast must have walked more than a hundred miles. Commander Gould wrote:

> A natural explanation of the facts seemed impossible to find, and difficult even to suggest; while any explanation certainly postulated the visit of something very uncanny—something which walked upon small hooved feet with a very short, mincing stride, which sought darkness and solitude, which had never rested, which had covered something like a hundred miles in a single night, which had crossed a river two miles wide, which had hung round human habitations without daring to enter them, and which had on some occasions walked up walls and along roofs, while at other times it had passed through such obstructions as if they did not exist.

[1] I owe this information, like most of the rest about this problem, to a close friend of his, Senhora Anna Isabel de Sa Leitão Teixeira, a regular correspondent of mine in Brazil.

There was a period of panic, during which people dared not go out after dark, and, as *The Times* wrote, "The superstitious go so far as to believe that they are the marks of Satan himself."

Far be it from me to suggest that both the *pe de garrafa* and the "Devil's hoof-marks" are due to the same hellish and ubiquitous beast, or to survivors of the Sciapods of antiquity, hiding in Brazil and Devon. But they may well have a common origin—a meteorological origin as Dr Maurice Burton has suggested might be the cause of the "Devil's hoof-marks," though no meteorologist has been able to put forward a phenomenon that would explain them. There is no proof that the bottle-like marks in Brazil have anything to do with the tales of ape-men current in the area. It would not be the first time that two sets of facts have been wrongly related, just because they were both mysterious. All the same, I should point out that an ape with feet much adapted to tree-dwelling and therefore with very curved toes, is obliged to walk on the outside edge of the foot, thus leaving a more or less ring-shaped mark. An orang-utan's footprint tends in this direction (see page 116). But, of course, this could not explain the Devonshire abominable snowman.

The fact that the footprints were in a dead straight line does not necessarily mean that the beast that made them had only one leg. It could have been a biped. The few people who have seen a *mapinguary* describe it much more prosaically than the old half-caste from the Upper Araguaya, as we shall see from an account told to the Brazilian writer Paulo Saldanha Sobrino, who has lived much of his life in the Amazon jungle. My Brazilian correspondent knows him well and vouches not only for his veracity but for his judgment of his informant's. This informant was a half-caste called Inocêncio, who is now the skipper of a steamboat which runs each week from Villa Bela to Guajarà-Mirim on the Rio Guaporé, but who once took part in several expeditions into the jungle.

In 1930 he went on an expedition of 10 men led by one Santanna. They went up the Uatumã towards the sources of the Urubú. When their boat came to an impassable waterfall they cut across the jungle to reach the Urubú watershed. After two days they reached a stream which the leader decided to follow. Inocêncio was in the party going upstream, but after two hours' march he was led astray by a troop of black monkeys which he followed in the hopes of shooting one. When he realised that it would take him some time to reach the stream again, it was already too late. He shouted and fired his gun, but there was no reply except the chatter of monkeys and squawks of angry birds. So he began to walk

almost blindly, feeling he must do something in such a critical situation, until night fell, when he climbed into a large tree and settled himself in a fork between the branches. As it grew dark the night was filled with jungle noises, and Inocêncio rested happily enough until suddenly there was a cry which at first he thought was a man calling, but he realised at once that no one would look for him in the middle of the night. Then he heard the cry nearer at hand and more clearly. It was a wild and dismal sound. Inocêncio, very frightened, settled himself more firmly into the tree and loaded his gun. Then the cry rang out a third time and now that it was so close it sounded horrible, deafening and inhuman.

> Some forty yards away was a small clearing where a *samaumeira* had fallen and its branches had brought down other smaller trees. This was where the last cry had come from. Immediately afterwards there was a loud noise of footsteps, as if a large animal was coming towards me at top speed. When it reached the fallen tree it gave a grunt and stopped. . . . Finally a silhouette the size of a man of middle height appeared in the clearing.

The night was clear. There was no moon, but the starry sky gave a pale light which somehow filtered through the tangled vegetation. In this half-light Inocêncio saw a thick-set black figure "which stood upright like a man."

> It remained where it stood, looking perhaps suspiciously at the place where I was. Then it roared again as before. I could wait no longer and fired without even troubling to take proper aim. There was a savage roar and then a noise of crashing bushes. I was alarmed to see the animal rush growling towards me and I fired a second bullet. The terrifying creature was hit and gave an incredibly swift leap and hid near the old *samaumeira*. From behind this barricade it gave threatening growls so fiercely that the tree to which I was clinging seemed to shake. I had previously been on jaguar-hunts and taken an active part in them, and I know how savage this cat is when it is run down and at bay. But the roars of the animal that attacked me that night were more terrible and deafening than a jaguar's.
>
> I loaded my gun again and fearing another attack, fired in the direction of the roaring. The black shape roared again more loudly, but retreated and disappeared into the depths of the forest. From time to time I could still hear its growl of pain until at last it ceased.
>
> Dawn was just breaking.

Not until the sun was well up did Inocêncio dare to come down from his perch. In the clearing he found blood, broken boughs of bushes and smashed shrubs. Everywhere there was a sour penetrating smell.

Naturally he did not dare to follow the trail of blood for fear of meeting a creature which would be even more dangerous now that it was wounded. Taking a bearing on the sun he at last reached a stream and rejoined his companions, who fired shots so that he should know where they were.

> I maintain I have seen the *mapinguary* [Inocêncio said to Paulo Saldanha]. It is not armoured as people would have you believe. They say that to wound it fatally you must hit the one vulnerable spot: the middle of the belly. I can't say where it was wounded by my bullet, but I know it was hit, for there was blood everywhere.

This story has the ring of truth, and is told in more sober fashion than most Brazilian hunters' tales, true though they often are. Inocêncio claims to have done nothing to boast of, and he does not make the animal in the least fantastic. It has two legs like everybody else. Like the legendary *pe de garrafa* it emits terrible roars, but they do not send the hearer mad, and likewise it gives off a strong smell, but it is not really asphyxiating. Its behaviour is just what one might expect of a powerful great ape—a great ape like the one shot by Loys in Venezuela and seen by Miegam and Haines in Guiana.

Charles H. Dewisme, the writer, and I decided several years ago that we ought to try to get to the bottom of the matter by going through the forests of the Sierra de Perijaá with a fine toothcomb in the hopes of catching or at least photographing one of these mysterious great monkeys. We still hope to make this expedition when we can raise the money to do so. Meanwhile, in December 1953 Dewisme went to Colombia to collect first-hand information on the spot. He talked about the Amer-anthropoid with Dr Parra, director of the Institute of Ethnology at Magdalena, who was a close friend of Gerardo Reichell-Dolmatoff, of the Colombian Institute of Anthropology, who had several times visited the Motilone Indians in the Codazzi area. These Yuco as they are called, told Reichell-Dolmatoff that a large tailless ape did in fact live in the Sierra de Perijaá, they spoke of it as an animal as familiar as the tapir or the jaguar.

Dewisme showed Loys's photo to many hunters who all agreed that the animal was not a *marimonda*, although it looked slightly like one. During a reconnaissance expedition in the Sierra de Santa Marta, my friend also met the female chieftain of the Arawak Indians, Maria Eufemia Solis, who was of the same opinion.

Among the Arawaks he heard the legend that I have already mentioned about the men with their feet the wrong way round.[1] This, for reasons that I have explained in the chapter on the abominable snowman, is based on a bear, the spectacled bear (*Tremarctos ornatus*) which lives in the Cordillera of the Andes from Colombia to the north of Chile and Bolivia. Thus we see again how the most absurd legends may be based on actual fact. Neither the dwarf *guayazis* nor the *matuyús* whose feet are the wrong way round are myths. One day we may even discover the origin of the *curinquéans*, those ogres of South American folk-lore. As to the Venezuelan satyr, the only unknown animal of which we have an excellent photograph, its existence cannot, I think, be disputed except by the disingenuous and the blind.

[1] The Arawaks also spoke—though not so seriously—of a sort of hairy monster, half-man half-spider-monkey, called *mojan*. It lived in a cave on the upper Rio Cordoba; at night it came and threw stones on the roofs and tried to drown anyone out late. May this not be a version, which has been altered and embellished in transmission over a distance, of the tales about the Amer-anthropoid whose habitat is much further to the south?

Part Five

THE GIANTS OF THE FAR NORTH

The creation of the mammoth was a blunder of the Superior Being. In creating such an enormous animal, the Creator did not take into consideration the size of the earth and its resources. One earth could not stand the weight of the mammoth and its vegetation was not sufficient to feed the mammoth race. The mammoth fed on tree trunks which he ground with his teeth, and in a short time the whole North of Siberia was deprived of trees. Hence is the origin of the northern tundra. In the beginning the earth had the form of an even plain, but by his weight the monster animal in moving about caused the formation of valleys and ravines in which rivers originated. In swampy or sandy places the mammoth sank into the ground and disappeared under the earth, where he froze during the winter. Often in the hole over him water gathered into a lake. In this way the mammoth gradually disappeared from the earth's surface. This is why now whole cadavers of the animal are to be found in the frozen soil.

Yukaghir tradition quoted by WALDEMAR JOCHELSON.

Barents Sea
ARCTIC OCEAN
Novaya Zemlya
Wrangel I.
Bering Strait
Bering Sea
Aleutian Islands
Komandorski Is.
Kamchatka
Nizhni Kolymsk
Berezovka
Kolyma
Indigirka
Lena
Taimyr Peninsula
Gulf of Ob
Pechora R.
Ural Mountains
Discovery of living Mammoth
Ob
Yenisei
Vilyui
Yakutsk
SIBERIA
Sea of Okhotsk
Sakhalin I
Kurile Islands
Irkutsk
Lake Baykal
OUTER MONGOLIA
MANCHURIA
SINKIANG
Tundra
Coniferous Forests
Discoveries of frozen mammoths
Miles
0 200 400 600 800 1000

CHAPTER FIFTEEN

The Mammoth of the Taiga

> This Creature, though rare, is found in the East
> of the Northern Siberian Zone.
> HILAIRE BELLOC, *The Frozen Mammoth.*

THE Lapps believe in monstrous beasts which live under the eternal snows; and throughout northern Siberia we find the same belief in a hairy monster of underground habits. The Chuklukmiut Eskimos on the western shore of the Bering Strait call it *kilu kpuk* or "the kilu whale." This whale fought with the sea-monster *aglu* and was driven on to the land, but was too heavy and sank into the ground. Thereafter it moved underground using its tusks like shears, for they could move freely sideways in their sockets.

The Chukchi, who live in the north of the eastern tip of Asia beyond the River Kolyma, think that a similar monster is the evil spirits' reindeer or mount on which they ride. It lives beneath the ground and moves along narrow passages. When a man sees the monster's tusk sticking out of the ground he must dig it up at once, otherwise it disappears again and carries curses in its train elsewhere. Once some Chukchi saw two tusks coming out of the earth. They began their incantations and the beast miraculously appeared and provided them with a winter's supply of meat. From their descriptions there is no doubt that the monster is none other than the mammoth known to palaeontologists.

The Yukaghir, whose territory stretches beyond the Arctic Circle all along the Arctic Ocean from the Lena delta to beyond the Kolyma, also speak of the mammoth in their traditions and call it *xólhut*. Its spirit (*xólhut-áibi*), like that of many living animals, guards the soul of certain *shamans* or very primitive priests. A *shaman* who is protected by a mammoth's spirit is thought to be by far the most powerful. "According to

this notion," wrote Waldemar Jochelson, who reported these traditions at the beginning of this century, "one might say that there was a time when the mammoth was contemporary with man." According to Jochelson, who was in charge of the Riabouschinsky Expedition to the Aleutian, Kurile and Komandorski islands, the Yukaghir even have a traditional memory of the mammoth's disappearance (which I have quoted as an epigraph to this part). Oddly enough many scientists today explain its extinction in the same way. Among the Yukaghir of Nizhni Kolymsk who have come under Russian influence, the story has altered and taken on a biblical flavour. Noah, they say, wished to take a pair of mammoths aboard the Ark, but when the first of them put its feet on board, the ship almost capsized. So Noah hurriedly put to sea, leaving the mammoths behind, and thus they all perished.

Farther south, both among the Yakuts and the Ostiaks, who are true Mongols, and among the Koriaks, who are a Siberian race of whites who have settled on the shores of the Sea of Okhotsk, there are very similar legends about a sort of giant rat called *mamantu* or "that-which-lives-beneath-the-ground," from which the word "mammoth" is derived. It cannot survive the light of day. The moment it comes into the light it is struck dead. Its wanderings underground are the cause of earthquakes. Among the Kamchadals on the peninsula of Kamchatka we find a debased form of the legend; at all events it tells of a legendary figure called Tuila who moves underground on a sledge drawn by a dog. When he halts, the dog Kozei shakes the snow out of his fur, and this causes earth tremors.

In Mongolia and Manchuria the mammoth's ghost appears as a gigantic mole called *tai-shu* in Chinese classics written before the beginning of the Christian era. It is a hairy monster with tiny eyes and a short tail; and it digs enormous tunnels in the snow with its two teeth shaped like picks. In *The World of Animals*, an encyclopaedic work attributed to K'ang-Hsi (1662–1723), the first emperor of the Manchu dynasty, there is also an allusion to the Siberian legends:

> One can read in the ancient book *Chin-I-King* about the *fen-shü*, the underground rat of the North, which is also called *yen-shü*, the self-concealing mouse, or *shü-mu*, the mother of the mice, and in *The Mirror of the Manchu Language, jukhensinggheri*, that is to say "the rat beneath the ice." There is in the North in the country of the Olosses near the sea, a kind of rat as big as an elephant which lives underground and dies as soon as it comes into the air or is reached by the sunlight.

The royal author adds some more matter-of-fact details:

There are *fen-shü* which weigh as much as 10,000 pounds. Their teeth are like those of elephants: the natives of the North make bowls, combs and knife-handles, etc. out of them. I have myself seen these teeth and these tools made from them, and so I believe in the truth of our ancient books.

The Mirror of the Manchu Language (1771 edition) gives curiously exact information about the mammoth:

The rat of the ice or of mountain streams lives in the earth in the countries of the North, under thick ice. One can eat its flesh. Its hair is several feet long, and is used for weaving cloth upon which damp mists condense.

The natives of Siberia support their stories with the tangible evidence of ivory tusks, some of them as much as 16 feet long and weighing 450 pounds. There was once a flourishing trade in this ivory. At the beginning of this century the province of Yakutsk exported an average of 152 pairs of tusks per annum. During the last 200 years the tusks of some 25,400 beasts must have been sent out of this province alone. Altogether some 60,000 tusks have been sold during the same period. The trade is very ancient: it was mentioned in Chinese chronicles before the Christian era. Pliny the Elder had heard of it from the writings of Theophrastes, a pupil and successor to Aristotle, who reported that ivory was extracted from the ground, and, like the Siberian traders, made a distinction between white ivory and the less valuable black ivory. As early as the ninth century the Arabs entered the industry, buying their ivory at a market at Bolgari on the Volga near Nizhni-Novgorod (now called Gorki). Mammoth-ivory was certainly sold in Europe from this time, but as it came from merchants from the south no one was surprised.

In 1611 an English traveller called Josias Logan exhibited in London an elephant's tusk that he had brought back from Russia. Everyone knew that elephants were only found in Africa and India. It was true that their remains had been dug up in Europe, but these were thought to have been left by Hannibal's armies. Yet Logan seemed to be an honest man. He said that he had obtained his astonishing trophy from a Samoyed, near the mouth of the Pechora, which flows into the Barents Sea.

In 1692 a Dutch diplomat called Evert Ysbrants Ides went to China on Peter the Great's behalf to make a peace treaty with the Emperor K'ang-Hsi. He reported that:

Amongst the Hills which are situate North-East of, and not far from hence [the village of *Makofskoy* near *Jenizeskoy*], the *Mammuts*

Tongues and Legs are found; as they are also particularly on the Shoars of the Rivers *Jenize*, *Trugan*, *Mongamsea*, *Lena*, and near *Jakutskoi*, to as far as the *Frozen Sea*. In the Spring when the Ice of this River breaks, it is driven in such vast quantities, and with such force by the high swollen Waters, that it frequently carries very high Banks before it, and breaks off the tops of Hills, which falling down, discover these Animals whole, or their Teeth only, almost frozen to the Earth, which thaw by degrees. I had a Person with me to *China*, who annually went out in search of these Bones; he told me as a certain truth, that he and his Companions found a Head of one of these Animals, which was discovered by the fall of such a frozen piece of Earth. As soon as he opened it he found the greatest part of the Flesh rotten, but it was not without difficulty that they broke out his Teeth, which were placed before his Mouth as those of the Elephants are; they also took some Bones out of his head, and afterwards came to his Fore-foot, which they cut off, and carried part of it to the City of *Trugan*, the Circumference being as large as that of the wast of an ordinary Man. The Bones of the Head appeared somewhat red, as tho' they were tinctured with Blood.

The Yakuts, Tungus and Ostiaks told him the usual legends about a subterranean monster:

But the old *Siberian Russians* affirm that the *Mammuth* is very like the *Elephant*; with this only difference, that the Teeth of the former are firmer, and not so straight as those of the latter. They also are of the Opinion, that there were Elephants in this Country before the Deluge, when this Climate was warmer, and that their drowned bodies floating on the surface of the Water of that Flood, were at last wash'd and forced into Subterranean Cavities: But that after this *Noachian* Deluge, the Air which was before warm was changed to cold, and that these Bones have lain frozen in the Earth ever since, and so are preserved from putrefection till they thaw, and come to light; which is no very unreasonable conjecture.

This very reasonable conjecture seems to have been overlooked, while the absurd tales of elephants that behaved like moles discredited these reports, and many European naturalists gradually came to the conclusion that they probably referred to an animal only distantly connected with the elephant, but also having large tusks of fine ivory: the walrus (*Odobaenus rosmarus*). Remains of this huge pinniped, which may reach a length of 16 feet and have tusks 2 feet long, had no doubt been confused with an elephant's. The tusks were of course much smaller, but the animal did at least live on the Siberian coast.

The ivory-merchants confused matters by selling their wares under the name of *mamontova-kost*, which means mammoth's "horn" and not its "tusk" or "tooth." The Yukaghir, who normally supplied them,

called it *xólhut-onmun*, or mammoth's "horn" or "antler." But this did not mean they had a false idea of its appearance; they always described it as having thick fur and horns which came out of its mouth. This misnomer had unfortunate results. Willy Ley in *Dragons in Amber* tells how:

84. Head of a male walrus.

> In 1722 a Swedish officer, Baron Kagg, colonel of the Royal Swedish Cavalry, returned home from Siberia, where he had been not as an explorer but as a prisoner of war. One of his fellow prisoners, Ph. J. Tabbert von Strahlenberg, had spent whatever time he had in inquiring about those rumors of a large ivory-bearing creature, possibly of subterranean habits, and had found a Russian who claimed to know about it and who drew him a picture which is reproduced on page 100. It was this picture which von Strahlenberg handed to Kagg to take with him to Sweden, where it is still preserved in the library of Linköping. It is hard to decide whether the Russian who drew this clawed and twisted-horned super-cow was sincere in his belief or whether he was indulging in a heavy-handed joke on his imprisoned enemy.

Ley adds:

> Baron Kagg obviously believed in the picture. Scientists didn't.

While the scientists in Europe were puzzling over the problem to no purpose, Peter the Great, whose curiosity had been aroused by Ides's reports, sent a German naturalist, Dr D. G. Messerschmidt, of whom he had a particularly high opinion, to explore Siberia and try to solve the

85. Fantastic drawing of a mammoth, obtained in Russia by Baron Kagg in 1722.

question of the incredible burrowing elephants. Either by good luck, or because mammoth's carcases were extraordinarily common, Messerschmidt happened to hear that one of these beasts had just emerged from the melting ice of the Indigirka. In 1724 a Russian soldier had arrived just in time to examine the remains, already largely putrefied and eaten by wolves. There was little left but the head. However, another witness called Michael Wolochowicz had also seen a huge strip of rotten skin which was sticking out of a sand dune there. It was thick and brown and covered with hairs like a goat's. But he declared that, "I could not mistake this skin for a goat's; it must rather be that of a Behemoth, since I could not attribute it to any animal I know of."

Dr Messerschmidt was so impressed by this theory that he had little difficulty in concluding that the *mammont* was no doubt the same animal that was mentioned in the Bible by the name of Behemoth. Subsequently there were even philologists who maintained that this name, pronounced *mehemoth* by the Arabs, was the origin of the word *mammont*. In fact, though its exact origin is unknown, there is not much doubt that it derives from *ma*, the word for "earth" among the Finns and Samoyeds, according to Olfers, and that it means "earth animal," or "that-which-lives-beneath-the-earth."

Actually Samuel Bochart had already conclusively and brilliantly proved in his *Hierozoïcon* (1692) that the biblical Behemoth was really the hippopotamus. Fortunately his work seems to have been overlooked, since the hippopotamus had nothing whatever to do with the matter and would have been sought in vain in Siberia. On the other hand, the rhinoceros did find its way into the picture. In 1771 the great German explorer and naturalist Peter Simon Pallas found among the melting glaciers of the Vilyui, a tributary of the Lena, part of a carcase still covered with thick dark-brown fur, mixed with long black hair like horsehair. He thought it must be a mammoth, yet there was no doubt that it was a rhinoceros. He therefore came to the conclusion that this beast was the origin of the legendary mammoth. For who would have expected that Siberia should yield not only hairy elephants, but also woolly rhinoceroses: the two-horned rhinoceros with divided nostrils (*Tichorhinus*) and the one-horned *Elasmotherium*?

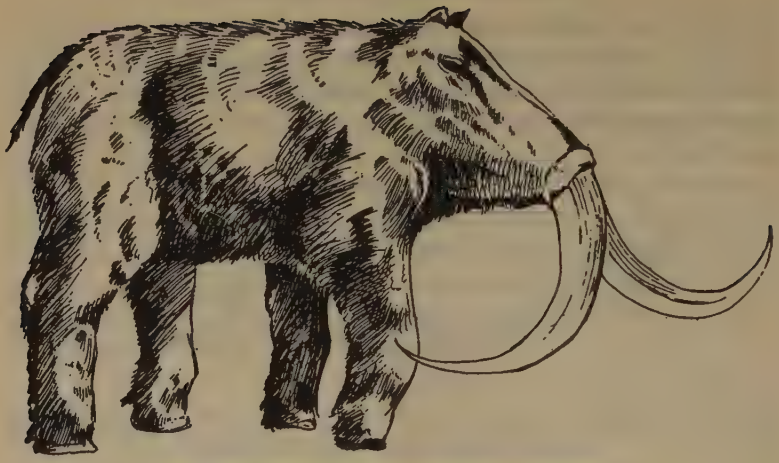
At the end of the eighteenth and beginning of the nineteenth centuries the first palaeontologists established that animals of this sort had once lived in western Europe. In the Middle Ages when fossil remains of mastodons, mammoths or rhinoceroses were accidentally dug up in Europe they were thought to be relics of giant men, Titans or Atlantes.

Bones of these animals were preserved in churches and attributed to dragons. And the mammoth's tusks were thought to be unicorns' horns. Now, in 1799, Johann Friedrich Blumenbach, of Göttingen University, solemnly announced on the evidence of the bones he had collected that

86. Woolly rhinoceros drawn on the side of a cave at Font-de-Gaume in the Dordogne (after the Abbé Breuil).

an elephant had once lived in Europe, and that its tusks were curiously curved in an arc of a circle, quite unlike those of living elephants. He named it *Elephas primigenius*—not very aptly, since it was more specialised than modern elephants, and had been preceded in earlier ages by many other trunked animals. Naturally he did not identify it with the huge hairy mole that the Siberians called *mammont*.

While this was going on in the west a mammoth appeared in flesh and blood to a Tungus chief called Ossip Shumakhoff. The beast was embedded in a block of melting ice somewhere in the Lena delta and only a distorted picture of it was visible through its glassy case. Ossip fled in superstitious terror, but curiosity overcame his fear and he came back from time to time to see if it was still there. Two years after he had first seen it, one of the tusks emerged from the ice, and he was much tempted by the value of the ivory, but still terrified that the mammoth might come right out of the ice after its long sleep, for he had heard tales of people who had died from the mere sight of the monster. Indeed it preyed on his mind so much that he fell ill and thought he was dying. Fortunately there was a Russian merchant called Boltunoff in the village. He saw a chance of a profitable bit of business and managed to make Ossip forget his fears and take him to the mammoth. In 1804 they went and violated its tomb, and found the beast now quite free of its shell; at first Ossip nearly died of fear, but soon he was helping Boltunoff to remove the tusks, and the shrewd Russian merchant immediately bought them for the miserable sum of 50 roubles.



87. The mammoth as drawn by Boltunoff.

Boltunoff also made a crude sketch of the beast which eventually came into Blumenbach's hands. This *mammont* did not look much like an elephant—its trunk had no doubt been ripped off by hungry wolves; the pressure of the ice had strangely twisted its tusks; its ears had come off, and as a result of decomposition Boltunoff had mistaken the ear-holes for eye-sockets! But Blumenbach had no difficulty in recognising his *Elephas primigenius*. Boltunoff's sketch of one of the molars left no doubt that it was the mammoth, and that the legendary beast was neither mole, super-cow nor rhinoceros.

Meanwhile a Russian botanist called Professor Adams had got wind of the rumours that a mammoth had been found preserved whole, and set off to see for himself. When he arrived he found wolves, arctic foxes, wolverines and even the Yakuts who had heard there was a stock of meat for their dogs, had all been there before him. Apart from the skeleton, from which one foot was missing, there was not much left of the beast: an ear covered with silky hair, an eye, the brain, some tendons, and the lower part of the legs. Three-quarters of the skin had been preserved. It was dark grey and covered with a reddish woolly fleece, with scattered black hairs like horsehair which on the neck were as much as 27 inches long. Adams set about collecting these relics. His native guides helped him to remove the skin which was almost an inch thick in places and needed 10 men to lift it. Then they carefully swept the ground and collected 37 pounds of hair. Everything was packed up with infinite care and sent to St Petersburg, where the skeleton was scrupulously remounted. The curators of the "Cabinet of Rarities" founded by Peter the Great

had bought it from Professor Adams for 8,000 roubles—160 times as much as poor Ossip got for his precious tusks. It may still be seen in the Zoological Museum at Leningrad. The skin had lost all its hair on the journey, but it was now known for certain that the *mammont* was a hairy elephant, though many details about its appearance were still a mystery.

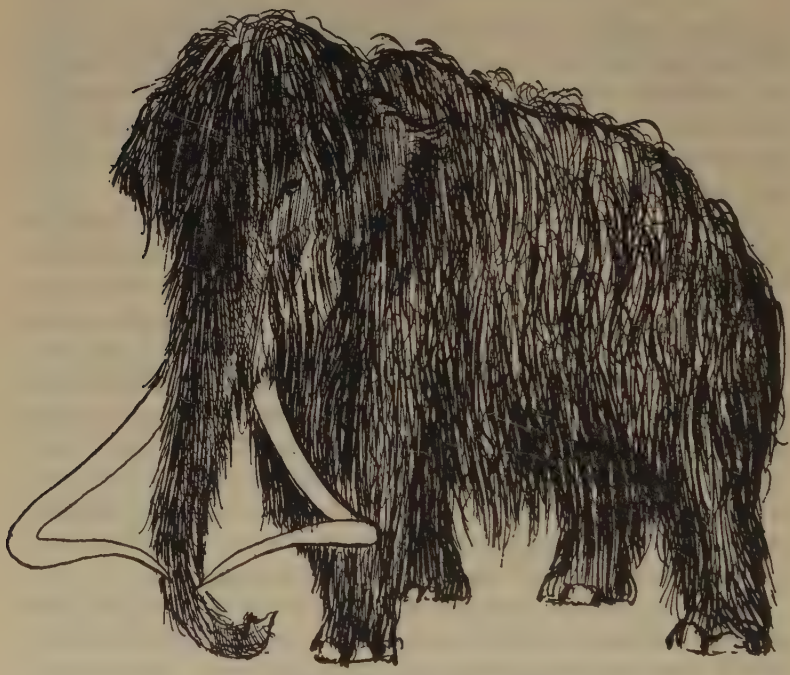
At least a score more frozen mammoths were discovered in northern Siberia between the Ob and the Bering Strait, the most recent being in 1935 (Wrangel Island) and 1948 (Taimyr Peninsula), and there is no reason why many more should not come to light as erosion gnaws away ceaselessly in the subsoil at layers of clay which cover the beds of fossil ice where the hairy giants sleep.

In April 1901 the Imperial Academy of Science of St Petersburg learnt from the governor of Yakutsk that a mammoth in a perfect state of preservation was imprisoned in a melting glacier on the banks of the Berezovka, a tributary of the Kolyma which flows through eastern Yakutsk. The Tsar offered 16,000 roubles to the Academy, who hastened to send off an expedition under Dr Otto Herz, Curator of the Academy's Zoological Department, an entomologist whom one might expect to chase nothing larger than butterflies. This time wolves and other scavengers had not been able to eat all the carcase. Only the head emerged from the ice and had begun to thaw; and only the trunk, the chief delicacy, had been eaten. But bacteria were already hard at work, and an appalling stench arose from the putrefying meat.

To cut up a carcase which would gradually turn into an ever fouler cesspit was certainly a task to make any but the most devoted scientist blench. Besides Dr Herz, the expedition included D. P. Sevastianov, a geologist from Yurievsk University, a Cossack called Innokenti Iavlovski, who had already been to the place, and a young German taxidermist, E. W. Pfizenmayer. This 36-year-old Swabian who had always dreamt of excavating prehistoric monsters found his wish coming true with a vengeance. He was able to dissect the animal and study the smallest details of its anatomy. As he had several more opportunities again later, his work on the mammoth eventually became the world's greatest authority.

As a result we now have an excellent idea both of the habits and exact appearance of the Siberian mammoth (*Elephas berezovkius*). It was covered all over its body with a reddish-yellow woolly fleece and also with long black hairs like horsehair, between 1 foot and 2 feet 3 inches

in length, which hung from its cheeks, lower jaw, shoulders, flanks and abdomen, making a sort of overcoat which reached almost to the ground. The colour of the wool has faded with time and the beast was probably mainly reddish-black. It had a short tail, under the root of which was a flap of skin which protected its anus from the cold.[1] Its thick skin was lined with a layer of fat about 3½ inches thick, and on the crown of



88. The mammoth as it really was.

its head and on its withers it had two fatty humps, which, like the camel's, served as a reserve of food.

Its concave forehead and small ears remind one of the Indian elephant (*Elephas indicus*). Between the frozen animal's stomach and diaphragm a large mass of clotted blood was found. This was carefully preserved and subsequent serological reactions proved conclusively that the Siberian mammoth was closely related to the Indian elephant. If for example you inoculate a rabbit with the blood of a known animal, it

[1] The Indian elephant has a similar flap which probably acts as a protection against insects. This common feature shows the close relationship between the two species.

forms an antibody to its serum, which will then precipitate the serum of animals of the same kind. Thus it has been shown that a rabbit's serum which has been rendered "anti-mammoth" precipitates the serum of the Indian elephant but has no effect on that of the African elephant (*Loxodonta africana*).

Here I should say a word about the size of the mammoth. In *Le Petit Larousse Illustré* you will find under *Mammouth* a picture of a man looking at a reconstruction of the hairy elephant. From their relative sizes the animal seems to be about 20 feet high at the withers. No mammoth was ever so enormous. True, there are various species of mammoth; there was once a giant North American species (*Elephas imperator*) which was a little over 13 feet high. Fraas's German mammoth (*E. fraasi*) was no doubt some 18 inches taller, but the Siberian mammoth was not even 10 feet high. It was a little smaller than the Indian elephant, which sometimes reaches that height, while the African elephant may be as much as 12 feet high at the withers. All the same the Siberian mammoth's humps and its shaggy coat must have made it an impressive mountain of fur.

We also know exactly what the Siberian mammoth ate. Thanks to Pfizenmayer, who in his first dissection removed from the stomach over 30 pounds of food which had been chewed but not digested, botanists were able to reconstruct its diet: the menu began with a species of gentian, its main dish consisted of grasses and sedges seasoned with wild thyme, for dessert there were two kinds of mosses, all flavoured with alpine poppy, upright crowfoot and a sort of northern orchid. The seeds present showed that the beast had died in the autumn. As Pfizenmayer pointed out:

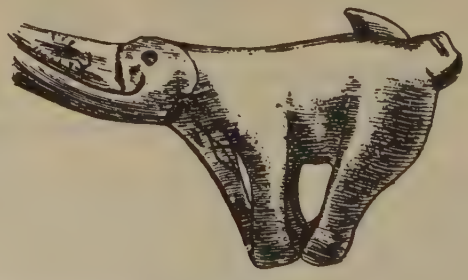
> The mammoth's food is composed of the same plants that still grow today in the close neighbourhood of the site of the discovery, plants that we have gathered and preserved in order to compare them.

All this might have served as a good argument that mammoths still existed, as many peoples near the Arctic Ocean believed, had not modern science strangled these legends at birth. Cuvier's Theory of the Revolutions of the Globe, by which it was *a priori* impossible for any creatures of a past age to have survived, convinced most scientists in the beginning of the nineteenth century that the mammoth, whose fossil remains had been found almost everywhere, in Europe as well as North America, was a vanished species. The specimens found intact frozen in glaciers, with flesh that could still be eaten, *must* therefore have been preserved in

deep-freeze for 10,000 to 100,000 years according to various estimates. Nevertheless, John Frere had shown in 1797 that man was contemporary with large extinct animals when he found in Sussex worked flint weapons mixed with their bones. In 1823 the French geologist Ami Boué sent Cuvier a human skeleton excavated from ancient deposits which also contained the remains of extinct animals. Cuvier hushed up the awkward discovery. Similar discoveries soon became ever more frequent—as a result of systematic excavations, until Tournal in 1829 and Schmerling in 1833 came to a categorical conclusion. Cuvier died very opportunely in 1832, leaving his successors to carry on his theory and make fools of themselves all over the world. But ridicule works slowly.

When Jacques Boucher de Crevecœur de Perthes, an Abbeville Custtoms officer and keen amateur of fossils, suggested that the "diluvian axes" he had excavated in the Somme valley might have been used for hunting mammoths, there was much laughter at the Académie des Sciences. Corroborative discoveries by Rigollot and Noulet in France, and by the great English scientists, Falconer, Flower and Lyell, even Albert Gaudry's detailed work—all made no difference. In 1863, Élie de Beaumont, Permanent Secretary of the Académie, was still able to state categorically: "I do not think the human species was contemporary with *Elephas primigenius*. Cuvier's opinion was the work of a genius, it has not been overthrown."

A year later, Édouard Lartet, the founder of human palaeontology, whose fundamental thesis the Académie had refused to publish, discovered at La Madeleine a flat piece of ivory upon which a Stone Age



89. Mammoth carved in reindeer-horn found at Bruniquel in France in 1868.

man had engraved a masterly drawing of a mammoth. Naturally this was thought to be a fake. It clearly shows the fatty hump on the skull, which at that time no one knew anything about. Not until the Bere-

zovka mammoth was dissected in 1901 was it conclusively proved to be genuine.

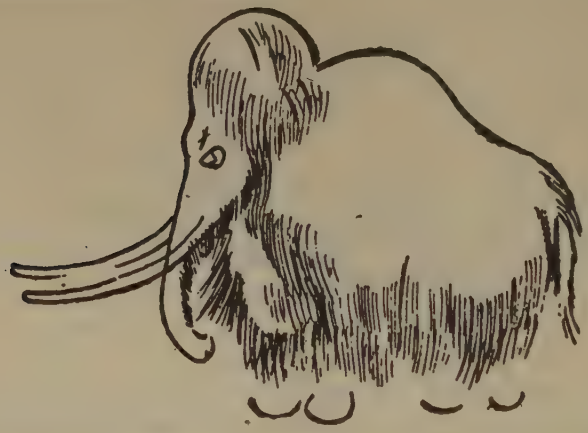
Two points were now established: firstly that the mammoth, whose remains had been found all over Europe from the Arctic to the Alps and the Pyrenees, once spread over a vast territory; secondly that the strikingly accurate drawings of it in caves in the Dordogne showed that it had been contemporary with man. These murals and carved ivory and reindeer-horn figures usually date from the Magdalenian period, that is to say the upper Palaeolithic. As the mammoth had vanished, but man survived, Cuvier's notion of a "Revolution of the Globe," or universal cataclysm that spared hardly anyone, was no longer tenable. Lyell had

90. Picture of a mammoth on the wall of the cave at Les Eyzies in the Dordogne (after Capitan, Breuil and Peyrony).

shown that folds in the earth's crust, like sedimentary deposits and erosion, were the result of slow and persistent forces which may still be felt. But if there was no universal deluge or cataclysm, what had caused the mammoth's extinction?

Mammoths had certainly survived in northern Siberia much longer than in central and western Europe—and for obvious climatic reasons. The Siberian tiger is hairier than the Indian; the Alaskan bear has longer fur than its Malayan brothers; the bison and musk-ox, unlike the cattle of warmer regions, are covered with thick fur. Any animal with thick fur is plainly adapted for a cold climate. The mammoth's thick coat, in contrast to the Indian and African elephants' smooth and bare skin, shows that it belongs to a cold region. If it once lived over most of Europe and North America, the temperature was then much colder

there than now. And in fact Goethe's penetrating deductions, Charpentier's observations and those of his friend Louis Agassiz, the famous Swiss geologist, and finally Otto Martin Torell's brilliant synthesis showed that glaciers, which now are found only in Scandinavian mountains, formerly spread for a long period over the whole of northern Europe, transforming what had been a world of lush vegetation inhabited by animals now found only in the tropics into a Siberian tundra. Penck and Bruckner later proved that since the end of the Tertiary era this ice-cap has advanced and retreated four times. The Quaternary era therefore consists of alternate glacial and interglacial periods, each with its own peculiar fauna.



91. Mammoth in the cave at Font-de-Gaume (after the Abbé Breuil).

In Europe the mammoth (*Elephas primigenius*) and the rhinoceros (*Rhinoceros tichorhinus*) belong to the last, so-called Würmian, glacial period, which, according to the most exact estimates, took place not more than about 12,000 years ago. It seems logical to suppose that these hairy elephants and woolly rhinoceroses followed the retreating glaciers northwards when the temperature grew too warm for their liking after the long Würmian winter, which (if we include a calm of some 25,000 years) had lasted more than 50,000 years. But if they deserted the countries that had become too warm as thick forest gradually spread over the ancient steppes and even the tundra, this does not explain why they vanished from northern Siberia; for there they could still have found what seems to be their favourite climate.

At the end of the last century one of the greatest experts on the mam-

moth, Frederic Lucas of the United States National Museum, had to admit that he could not explain the extinction of an animal which was not only well protected against the cold, but also seemed actually to prefer low temperatures. Perhaps many of them were washed out to sea by floods caused by melting river ice, but this was not enough to account for total extinction.

In 1919 this unsolved problem led the French zoologist Neuville to wonder whether the mammoths were really so well protected against the cold as had been supposed. Had they not become extinct because of the cold rather than in spite of it? After all, they must have suffered a very low temperature for their carcases to remain preserved until today. In their stomachs had been found remains of plants which are not characteristic of a severe climate. Apart from the Alpine poppy and one other plant which grow in the tundra in the summer, they are not typical plants of this so-called "permafrost," the area where the ground is permanently frozen. On the contrary they are typical meadow flora. Does this mean that a sudden wave of cold had destroyed the vegetation and starved the mammoths? Neuville thinks not, since such a sudden cataclysm could not account for their extinction over so wide an area. And it seems to me that if this had happened their stomachs would have been found empty, their reserves of fat exhausted and their bodies wasted away.

Their extinction does not seem attributable to any outside cause. Neuville therefore made a careful study of the mammoth's skin compared with that of living elephants. He found they were identical. Neither had any sebaceous or sweat-glands. Without them, without a constant flow of sebum and sweat to oil the hair and keep the fleece waterproof, the mammoth's thick fur would be no protection against cold and damp. Snow and icy rain would be able to penetrate its thick coat, soaking it through and through until it became a wretched cloak of ice, frozen to its skin. Neuville also pointed out that the exaggerated curve of the tusks, which sometimes form three-quarters of a circle, made them useless weapons, indeed nothing more than rather cumbrous ornaments. Moreover the hind-feet are usually provided with horny excrescences like extra nails, which, according to Neuville, must have made it very hard for it to walk. In short, its extinction was due to progressive degeneration, due to its lack of adaptation to cold, aggravated by other causes and perhaps accelerated by an increasing lack of food.

Neuville's arguments do not seem to me very conclusive. The permeability of the mammoth's fur is largely compensated for by the unusually

thick layer of fat beneath its skin. Moreover, the flap of skin covering its anus shows that its smaller details were well-adapted to very low temperatures. The horny excrescences on the feet, far from hindering it, may have acted as snowshoes to prevent it from sinking too deeply into snow or soft earth. And obviously if it was so ill-protected against the cold it would have stayed in Europe after the Würmian glaciers retreated. At all events it would not have fled from the heat of the south to die of cold in Siberia. Even the argument about its excessively curved tusks is not very convincing. The elephant uses its tusks as clubs as well as spears; it does not usually transfix its enemies, it crushes them. A mammoth's tusks are not therefore such negligible weapons.

If the mammoth did not perish for external climatic reasons, nor because of its own degeneration, why is it extinct? The latest and most generally accepted theory blames its extinction on a series of accidents. The Berezovka mammoth died as a result of an accident, its *post mortem* showed that its hind-leg and its pelvis were broken. Apparently it had slipped, and fallen into a deep crevasse, which was no doubt hidden by a layer of earth and plants. In its struggles to escape from this natural trap it brought down vast quantities of frozen earth which eventually buried and froze it. In certain conditions such accidents might have happened on a large scale. The very size of the brutes might be the reason not only for their extinction, but also for the perfect preservation of their corpses. When the hordes of mammoths followed the last of the retreating glaciers they were gradually led to the north-east. When they inadvertently ventured on to the marshy plains of North Siberia, their own weight made them sink into the icy mud, where they have been preserved ever since. This explanation certainly agrees curiously well with that given by the Yukaghir traditions, quoted as an epigraph on page 329.

That such catastrophes were often repeated is more than likely, but is it right to explain the *total* extinction of a species by a series of accidents, that is to say by blind chance? Animals do not leap into nature's traps with their eyes shut; on the contrary they are always cautious and distrustful of anything they do not know. It is hardly likely that all the mammoths in the world would have chosen to live in the one place where they had the greatest chance of being buried alive.

It is all very well to try to establish the reason why the mammoth is extinct and to be dissatisfied because none of these reasons is convincing, but first of all ought we not to prove conclusively that it really is

extinct? The reindeer, elk, musk-ox, Przewalski's horse, wolverine, arctic fox, lemming and mouse-hare all lived in western Europe with the mammoth during the Würmian glacial period. They all left it, but they all found refuge in other countries that were more to their liking, such as Alaska and Siberia. Why not the mammoth? Many palaeontologists have admitted that it could have survived until "relatively recently." Could it not have survived until today in a land as little known as the country of the Yakuts, the Ostiaks and the Yukaghirs? Legends of "hairy giants" have always been current. What are we to make of these legends?

Van Gennep has observed that a memory of a past event, if transmitted only by oral tradition, hardly lasts two centuries. The tales of encounters with mammoths cannot possibly have been handed down for tens of thousands of years. It seems to me that these legends, which may be thought to be a strong argument in favour of the mammoth's survival, are more likely to be due to frozen specimens in a perfect state of preservation, some of which were discovered in dramatic circumstances. One of them was enshrined in a block of ice, standing up and facing the sea. It began to thaw, the beast was already partly free of the glacier, it seemed to be rearing up with its huge tusks raised in a threatening manner. The man who saw it was struck with terror and was said to have gone on for a long time about "the evil light in the giant's eyes."

A sudden encounter with the great hairy beast in the middle of lonely icefields would naturally excite the imagination of simple people, most of whom, when they saw it from afar, never dreamt that it could be dead, let alone dead for thousands of years. This explains the legend about the giant mole living in burrows under the snow, which seems so out of keeping with an elephant; it refers to the fact that they are always seen rising out of the snow, and they die as soon as they are exposed to the light, since they are never seen to move. The discovery of giant footprints and huge excrements can be explained by the thawing out of tracks where mammoths once passed.

Here one might close the question of the living mammoth. Indeed I did so in an article in *La Marche du Monde* in 1952 in which I concluded,

> No doubt the theory that the mammoth survives is attractive to the naturalist and fit to arouse the imagination of adventurous minds, but the legends which refer today to this once fabulous animal can be interpreted in a more prosaic fashion.

Afterwards I had a slight sense of uneasiness, a feeling that there was something that I had overlooked, or rather something which everyone had taken for granted without inquiring whether it was true. And then suddenly I realised what this was: the assumption that *the mammoth was an animal of the tundra and the arctic prairies*. What is it based on? Apparently on the fact that it is almost always in the tundra that the carcases of frozen mammoths have been found. But is this a sufficient reason? Obviously they are most likely to be frozen whole in these icy and marshy plains; but might they not prefer to live elsewhere? For instance the fact that fossil remains of monkeys, lions and hippopotami have been found in Europe does not mean that these animals belong to temperate regions. On the contrary it is taken to imply that our countries once had a warmer climate.

The present tundra is an exactly similar case. The temperature in the whole of Europe was once much higher than it is today, particularly between the second and third (Mindel and Riss) glacial periods. Now it has been shown that the Scandinavian glaciers did not reach beyond the Urals: in fact the whole of Asia escaped them. Thus the higher temperature was especially marked in Asia, where the glaciers did not come. Therefore it is likely that the taiga, the vast forest which covers all the middle of Siberia, once stretched farther north and covered the very place where most of the remains of mammoths were found. Must not the temperature have been milder to lead such animals as elephants and rhinoceroses to venture into these regions?

The analysis of the Berezovka mammoth's stomach contents shows that at the end of the summer it ate typical meadow flora. But subsequent analyses of other mammoths have proved that in winter the mammoth browsed on the leaves and branches of conifers, arctic willow and other dwarf northern trees. It therefore seems that in winter at least the mammoth did as the reindeer does today and went into the taiga, the vast forest of conifers, willow and birch in central and eastern Siberia. I think it must have spent most of the year there and only in the spring and arctic summer—the four months during which the surface layer of ground thawed—did it venture out into the plains, which were suddenly covered with tasty grasses and scented flowers.

Neuville has very truly observed that the mammoth's skin, which lacks sebaceous and sweat-glands, is a poor protection against snow and rain. But, as I have pointed out, though the mammoth is ill-armed against the wet, it is not so against the cold. And there is one place where a beast of the mammoth's size could shelter from rain and snow:

in the forest under trees. Certainly not on the bare and icy plains. To insist that the mammoth is an animal of the tundra is as foolish as to try to raise frogs in the Sahara. There is not a single animal which lives alongside the type of country to which it is best adapted—except, of course, for man, who adapts himself to any climate he chooses.

The theory that the mammoth belongs to the forests was confirmed after the original edition of this book was published, by the recent work of the Soviet academician E. N. Pavlovsky on a mammoth's carcase, partly dismembered by beasts of prey, which was excavated in 1948 from the banks of the River Mamontova in the Taimyr Peninsula. Vegetation dating from the same period was found beside the animal, chiefly large branches of willow and dwarf birch. This showed that the climate was less severe when the mammoth perished, for willows are not now found less than 500 miles to the south. Pavlovsky concluded that the mammoth lived in a country of which at least half was forests and peaty plains.

Professor Raymond Vaufrey, of the Institute of Human Palaeontology of Paris, sums up the final conclusions, reached after a thorough inquiry by many Soviet scientists, as follows:

> The mammoth is not an arctic mammal; the climate in the areas where its frozen carcase is found was warmer than today; the forest zone reached much further north. In the spring and summer it is probable that the mammoths migrated to the north, perhaps to escape being bitten by blood-sucking diptera (as in the case of the reindeer).

When the glaciers retreated and the mammoths apparently left western Europe and followed the moderately cold climate to the north-east, the great beasts must have moved slowly after them, and taking into account the impassable barriers formed by rivers too big for mammoths to ford they must have passed through at least 600 miles and sometimes more than 2,500 miles of taiga to reach the places where their frozen bodies were found. In this endless forest of pine and birch, broken only by lakes and marshes, they would have found plenty of food (the same plants grow in the taiga as grew in Europe during the glacial period), a choice of drinking-places, and perfect shelter under the scattered trees, where they could graze in peace and move their bulky bodies with ease under the protecting branches.

I should hasten to explain that there is no need to assume that hordes of mammoths had carried out a vast organised retreat from Moscow in reverse. No doubt they once lived wherever there was a moderately

cold climate and great pine-forests like the taiga. They died out wherever the forest became too warm or thinned out so much that it was no longer any protection. In which case is it not possible that they may survive in the Siberian taiga? I think it is more than possible.

The taiga is the largest forest in the world: it covers nearly three million square miles, more than thirty times the area of Great Britain, and about three-quarters of the area of the United States of America. This vast forest is largely unexplored, or little explored. Herds of hundreds or even thousands of mammoths could easily live there without running the least risk of being seen by man. In fact the extraordinary thing is that some of these mammoths sometimes *are* reported to have been seen by the Ostiaks and Yakuts who live in the forests.

There is also a more circumstantial account of an adventure which is supposed to have occurred to a Russian hunter in 1918. He told his story in 1920 to M. Gallon, who was then *chargé d'affaires* at the French Consulate at Vladivostok. In March of that year an employee of the Russian Asiatic Bank came to ask if he might introduce his brother, who had recently returned from four years in the taiga. Gallon gladly accepted the offer; he had few opportunities to question anyone about this huge area inhabited only by animals; for the few hunters who ventured into it never went far from the Trans-Siberian Railway, for fear of hungry wolves, bears and Usuri tigers. The brother proved to be a tall, elderly man, with very bright eyes, white beard and hair, and a tanned face seamed with scars. He was an almost illiterate peasant, but the French diplomat was taken with his conversation and invited him to lunch, during which he told the following extraordinary tale:

> The second year that I was exploring the taiga, I was very much struck to notice tracks of a huge animal, I say huge tracks, for they were a long way larger than any of those I had often seen of animals I knew well. It was autumn. There had been a few big snowstorms, followed by heavy rain. It wasn't freezing yet, the snow had melted, and there were thick layers of mud in the clearings. It was in one of these big clearings, partly taken up by a lake, that I was staggered to see a huge footprint pressed deep into the mud. It must have been about 2 feet across the widest part and about 18 inches the other way, that's to say the spoor wasn't round but oval. There were four tracks, the tracks of four feet, the first two about 12 feet from the second pair, which were a little bigger in size. Then the track suddenly turned east and went into the forest of middling-sized elms. Where it went in I saw a huge heap of dung; I had a good look at it and saw it was made up of vegetable matter.
>
> Some 10 feet up, just where the animal had gone into the forest, I

saw a sort of row of broken branches, made, I don't doubt, by the monster's enormous head as it forced its way into the place where it had decided to go, regardless of what was in its path.

I followed the track for days and days. Sometimes I could see where the animal had stopped in some grassy clearing and then had gone on forever eastward.

Then, one day, I saw another track, almost exactly the same. It came from the north and crossed the first one. It looked to me from the way they had trampled about all over the place for several hundred yards, as if they had been excited or upset at their meeting. Then the two animals set out marching eastwards, one following some twenty yards behind the other,[1] both tracks mingling and ploughing up the earth together.

I followed them for days and days thinking that perhaps I should never see them, and also a bit afraid, for indeed I didn't feel I was big enough to face such beasts alone.

He had a good hunting gun, bought in his native village of Nikolski-Usuriski, which would take ball as well as shot, but he had only five cartridges loaded with ball left, hardly enough with which to attack such enormous game. All the same he followed the trail as fast as he could, and thought from the freshness of the tracks that he was gaining on the beasts. Meanwhile it was growing bitterly cold, and he had no way of getting warm in the evening except by drinking scalding tea and building a *naida* each night. This is a sort of tent of leaves and branches which keeps in the warmth of a wood fire for a long time.

One afternoon [he went on] it was clear enough from the tracks that the animals weren't far off. The wind was in my face, which was good for approaching them without them knowing I was there. All of a sudden I saw one of the animals quite clearly, and now I must admit I really was afraid. It had stopped among some young saplings. It was a huge elephant with big white tusks, very curved; it was a dark chestnut colour as far as I could see. It had fairly long hair on the hindquarters, but it seemed shorter on the front. I must say I had no idea that there were such big elephants. It had huge legs and moved very slowly. I've only seen elephants in pictures, but I must say that even from this distance (we were some 300 yards apart) I could never have believed any beast could be so big. The second beast was around, I saw it only a few times among the trees: it seemed to be the same size.

[1] This could not possibly have been deduced from the tracks, and could only be based on what he subsequently saw of the beast in motion. The hunter may well have been carried away by his story; and in any case we should not forget that M. Gallon, who certainly did not take this tale down verbatim in the middle of a meal, must have retold it and perhaps embroidered it himself.

All this time he had been hiding behind a big larch. He had put down his bag and was ready with his gun loaded and his axe pulled out of his belt. When evening came he reluctantly left his point of vantage, because he could no longer bear the cold. Next morning when he returned the beasts had gone. Winter had set in and the weather was too bitter for him to go on tracking them. It was time for him to find a sheltered place to settle for the winter, and in any case he had not the ammunition to open war on the beasts.

> Such [Gallon remarks] was the tale of this man who was too ignorant to know that what he had actually seen were mammoths. And when I told him the name, he did not show the least sign that he understood what I meant.

He had seen elephants "in pictures"—that was all.

When Gallon returned to France that same year he told this strange tale to his friends, but the political situation after the revolution was so confused that there was no hope of exploration. Not until 1946, when the Allies were still warm friends in the first flush of victory, was he persuaded to publish this story.

This report is very different from those of the tribes who live on the shores of the Arctic Ocean where mammoths' carcases have merely been seen emerging from melting glaciers. The best evidence, to my mind, of the truth of the story, is that the hunter says he met his mammoths in the forest, a place which is not usually supposed to be their natural habitat. Had he—or M. Gallon—been inventing the story he would surely have tried to give his tale authenticity by putting it in the traditional setting that one sees in all the reconstructions: the great hairy beast advancing with heavy steps through a desert of snow. This is a very unusual background for the animal.

If mammoths happened to leave the taiga in fine weather and go out to pasture on the flowers in the tundra it was often at peril of their lives. For they could easily be taken unawares, especially in September, by the first falls of snow or a sudden frost. Most of the carcases found in a perfect state of preservation are victims of winter which hid treacherous crevasses and marshes under a white blanket of snow. As the temperature gradually fell, the eternal ice spread, driving the forest and its huge inhabitants southward and imprisoning for thousands of years the straying mammoths that had been killed by the sudden arrival of the last winter.

The Soviet experts on the subject seem to have come round to the

view that the mammoth is a forest animal. The discovery in 1948 of the Taimyr Peninsula mammoth aroused new interest in the problem, and a scientific expedition was organised to investigate the problem of the mammoth's habitat. It is significant, as M. Marmet has pointed out, that this expedition was not asked to explore the country bordering the Arctic Ocean, where nine-tenths of the frozen mammoths have been found, but the forests round the Gulf of Ob, just where living specimens have several times been reported.

Let me conclude with evidence from a much earlier date, which is also quoted by M. Marmet. At the end of the sixteenth century the Stroganoff family, who owned salt-mines in Siberia, were concerned because they were being pillaged by brigands. They therefore decided to send Don Cossacks to set things to rights, and dispatched them on this police mission under Yermak Timofeyevitch in 1580. These Cossacks took their task so much to heart that they eventually conquered the whole of Siberia. They split into small bands, living on what they could pillage, and went down rivers, explored vast tracts of quite unknown country on their own account, set up towns and called upon Russian workers and their families to help them. After some 60 years of continual fighting with the native tribes, these Cossacks, or rather their successors, reached the Sea of Okhotsk on the Pacific Ocean. They had crossed the whole of Asia, rather like the Huns and the Mongols, but in the opposite direction. Right at the beginning Timofeyevitch reported that beyond the Ural mountains he met "a large hairy elephant." According to the natives it was part of the wealth of the Kingdom of Sibir, valued as food and known as "mountain of meat." This happened at a time when even the Slav world had never heard of the mammoth.

Part Six

THE TERRORS OF AFRICA

Ati, bwana! There is a story you will not believe, because you are a white man. White men laugh at the stories told by the black men. They say this is not so, and that is not so. We have not seen this or that, so how can it be? They say, Ho, Ho! Black men are like little children, telling tales to each other in the dark. But remember, *bwana*, white men have been in this country for a time that is less than the life of one man, so how can you know all the things that have been known to black men for a hundred lifetimes and more?

ALI, an old African hunter quoted in ROGER COURTNEY'S *A Greenhorn in Africa.*

FRENCH WEST AFRICA
Senegal
SIERRA LEONE
LIBERIA
IVORY COAST
Seguela
Bonake
Abidjan
Cavally R.
Cassandra R.
NIGERIA
CAMEROONS
FRENCH EQUATORIAL AFRICA
Ft. Crampel
Ubangi Shari
Bozoum
Bakala
Ippy
Bangui
Batouri
Dongou
Ouesso
Impfondo
Libreville
Ndjole
Port Gentil
Fernan Vaz
L. N'Gobi
Lambaréné
Lefini
Ouanda Djale
Ndele
Kouango
R. Gribingui
R. Kotto
R. Nile
SUDAN
Bahr el Arab
Lake No
Malakal
Bahr el Ghazal
Sobat R.
Shambe
Rejaf
ETHIOPIA
SOMALILAND
SOMALIA
Uele
L. Albert
Aruwimi
Ituri
Ayakubi
Stanleyville
L. Edward
Mt. Elgon
Eldama Ravine
Kisumu
Kinango
Mt. Kenya
KENYA
Meru
Embu
Nairobi
Magadi
Tana
Kilimanjaro
Mombasa
Entebbe
Jinja
Lake Victoria
Mara
UGANDA
Ruanda
Urundi
L. Kivu
L. Tumba
L. Leopold II
Kasai
Lusambo
BELGIAN CONGO
Wembere Plain
TANGANYIKA
L. Tanganyika
Dares Salaam
Kukuya
Katanga
Luanda
Cuanza
Cunene
Cuilo
Chiumbe
Kasai
L. Upemba
Bukama
Dilolo
Dala
Lualaba
L. Mweru
L. Bangweulu
Mchinga
Lindi
L. Nyasa
NYASALAND
ANGOLA
NORTH RHODESIA
Kafue
Zambezi
Barotseland
Livingstone
SOUTH RHODESIA
Salisbury
Chobe
Bulawayo
MOZAMBIQUE
SOUTH WEST AFRICA
BECHUANALAND
Kalahari Desert
Transvaal
ATLANTIC OCEAN
Miles
0 200 400 600 800 1000
Tropical Forests

CHAPTER SIXTEEN

Three Large Pygmies: the Forest Rhinoceros, the Water Elephant and the Spotted Lion

> There's a sort of tiny potamus, and a tiny
> nosserus too—
> . . . And I think there's a sort of a something
> which is called a wallaboo—
> A. A. MILNE, *When We Were Very Young.*

"IN Africa," Trader Horn has sagely remarked, "the Past has hardly stopped breathing." Several legends of unknown animals seem to refer to creatures of a long-vanished age and are rejected by sceptical scientists on that account. Yet the negroes have not had lessons in palaeontology and they could not know what prehistoric animals looked like. Though they interpret what they see in a most original way because their minds are dominated by sympathetic magic, and though they tend either from fear or from natural braggadocio to exaggerate the facts they report, there is always a real observation at the bottom of their stories—not a dream or a vision. More than once they have shown that they are good observers and that their interpretations of facts are not so ridiculous as was at first supposed. They were ridiculed for thinking that fevers were caused by mosquito-bites at a time when western medicine gave malaria its name in the belief that it was literally caused by "bad air." Now the negroes have been proved to be right.

In any case, animals thought to be extinct are more likely to have survived in Central Africa than elsewhere. Its climate has remained unchanged since time immemorial. The Ice Ages had no effect except to produce long rainy seasons. Geologically it has not changed for tens of millions of years, and it is the only continent which has not been largely

92. *Welwitschia mirabilis*, a vegetable relic of the Palaeozoic era, found only in a strip of the south-west coast of Africa.

submerged at some time since the beginning of the Primary era. It has also escaped the great upheavals of the Earth's crust. While the Alps were gradually forming from the end of the Mesozoic era until the present day, and the Rocky Mountains, the Andes and the Himalayas were all appearing, Africa had long been physically settled. So it is not surprising to find in Central Africa living specimens of types which once flourished in a large part of Europe: macaques, elephants, rhinoceroses, hippopotami, giraffes, lions and hyenas. The fauna of equatorial Africa like its flora (which includes the *Cycas* from the Mesozoic era and even the extraordinary *Welwitschia* from the end of the Palaeozoic) has always been several geological periods behind. For example, in Central Africa Dinotheriums have been excavated which were only 100,000 years old, although they vanished from Europe 5 million years ago.

As Dr Frechkop has pointed out, the fact that animals like the okapi, forest-hog and water-chevrotain (*Hyemoschus*) are found in Africa proves that "the equatorial forest is the nature reserve of primitive forms which have not been able to survive elsewhere." As it is almost impossible to penetrate this dense, dark and unhealthy jungle without disturbing the shy creatures that inhabit it, many of them may live there without our having the least chance of meeting them except in exceptional circumstances. Only the natives who live on the verge of the jungle, and more particularly the pygmies who live within it, are likely to know of some of these animals. So it is natural that the legends likely to interest us are mainly found along the vast equatorial rain-forest.

When Hans Schomburgk brought a pygmy hippopotamus back alive to Europe in 1913, and thus proved that at least one native legend was well-founded, he was probably more inclined to pay heed to others, one

of which referred to a sort of pygmy rhinoceros which, according to the Kroo, also lived in the mountainous part of Liberia. At first he thought the tales must refer to the forest-hog, a big black pig with large tusks, a variety of which is in fact found in eastern Liberia. But he soon found that the Kroo made a clear distinction between the large forest-boar and the little mountain rhinoceros, and he eventually came to believe they were right. Unfortunately all his attempts to discover a specimen of this absolutely unknown species failed—it was a harder task than looking for a needle in a haystack, since here the needle was on the move, constantly eluding its pursuers.

There is a good argument to show that this part of Africa may still conceal a pygmy rhinoceros. Professor Trouessart has said of the pygmy hippopotamus:

> The presence of this pygmy species in this particular area in the loop of Niger leads one to suppose that this country was an island separated from the continent at the time when the Atlantic still penetrated the north of West Africa, that is to say during the Eocene.

It has long been noticed that land animals which live on islands are generally smaller than the same or similar species living on the nearest continent. Thus the deer and the rhinoceroses on Java and Sumatra are smaller than those in India and Indo-China. In the Tertiary era a whole series of pygmy elephants and rhinoceroses lived on the Mediterranean islands of Sicily, Sardinia, Malta and Cyprus. This phenomenon, by which a creature's size seems to be related to that of the territory it lives in, has been attributed to what Moritz Wagner calls segregation, in which the lack of choice of sexual partners, the lack of variety in diet, and perhaps a less favourable climate all play a part. If the country in the loop of the Niger was once an island, one might expect its ancient fauna to have insular and therefore dwarf characteristics. If there were pygmy hippopotami, why not pygmy rhinoceroses?

No *known* rhinoceroses, fossil or living, are found in the area south of the Niger and Senegal rivers. This is odd, since the hippopotami and the elephants (which like them are pachyderms of similar habits, dating from the same geological period) spread over this territory. Perhaps the rhinoceroses in this area have remained unknown, because they are so small and can shelter in mountains covered with thick forests. The natives of Liberia are ignorant of this palaeontological argument, so it is all the more interesting that they should put the pygmy rhinoceros in the one place in Africa where we have reason to expect to find it.

Liberia is not the only part of Africa where rhinoceroses have been reported in quite unexpected places. Both the black rhinoceros (*Diceros bicornis*) and the white rhinoceros (*Ceratotherium simum*) live in open country, mimosa-covered steppe and wooded savannah; they sometimes venture through forest paths to the rivers where they bathe, but they never live in the heart of thick wet forest. The vast area they occupy in the eastern half of Africa hardly touches the tropical rain-forest except around the foothills of Mount Kenya and Kilimanjaro.

Now in January 1931 an official of the French colonial administration of the eastern Cameroons, Géraud de Galassus, told Lucien Blancou that there were rhinoceroses in the forest in the south of the Batouri subdivision which he administered. At that time Blancou thought that they must be the remnants of a population of savannah rhinoceroses, for he did not know the area in question. But when he became chief game inspector in French Equatorial Africa his opinion changed. Between 1949 and 1953 he collected, from three other French officials, Millet, Rolland and Rozan, information confirming the first report: according to the natives of the Kellé, Ouesso and Dongou districts on the Middle Congo River there was a species of rhinoceros in the very depths of the thick forests in those districts. This was confirmed by an engineer in the Forestry Department called Moiraud who had heard the same story from Europeans living at Epéna. In such a very peculiar habitat, the rhinoceros could hardly belong to either known genus. Blancou concludes:

> The Africans in the north of the Kellé district, especially the pygmies, know a forest animal larger than a buffalo, almost as large as an elephant, but which is not a hippopotamus. Its tracks are only seen at long intervals, but they fear it more than any other dangerous animal. The sketch of its footprint which they drew for M. Millet is that of a rhinoceros. On the other hand they do not seem to have said that it has a horn, though they have certainly not said that it has not. While M. Millet was at Kellé, in 1950 if I am not mistaken, one of the best known African chiefs in the district came several days' march to inform him that "the beast had reappeared." Unfortunately that is all I can say, for M. Millet left the district in 1951 and I have not been able to go there myself. The rewards in kind which this official offered the pygmies for a tangible proof of the animal's presence yielded no result.
>
> Around Ouesso the natives talk of a big animal which does have a horn on its nose—though I don't know whether it has one or several. They are just as afraid of it as the Kellé people.
>
> Around Epéna, Impfondo and Dongou, the presence of a beast which sometimes disembowels elephants is also known, but it does not

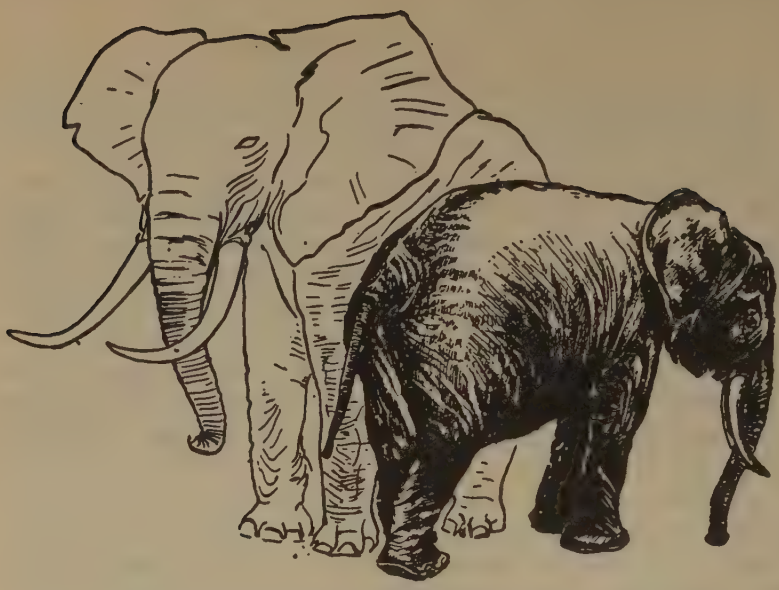
seem to be so prevalent there now as in the preceding districts. A specimen was supposed to have been killed twenty years ago at Dongou, but on the left bank of the Ubangi and in the Belgian Congo.

Blancou admits that all the evidence is pretty thin; but points out that the evidence upon which the okapi, forest-hog and Congo peacock and many other creatures were discovered was equally thin. He remarks that in the great wet forest where several of the least-known large species of mammals survive, there seems to be an "ecological niche" for a well-adapted rhinoceros. No doubt, like so many other animals, this species was once widespread but has gradually retreated into a small area of swamp and steep and thickly wooded mountains. In this it resembles the forest rhinoceroses of Java and Sumatra to which it may perhaps be related.

The latter rhinoceros (*Dicerorhinus sumatranus*) is by far the smallest, due no doubt both to its insular and forest-dwelling habits. The red buffalo of the forests is smaller than the black buffalo of the savannah, and probably the African forest rhinoceros is smaller than its brothers on the steppes; perhaps it is a true pygmy like its hypothetical Liberian cousin.

The African elephant is exactly parallel to the African rhinoceros. There are three sizes, one of which is still excluded from the official list. At the end of the last century Paul Matschie had already noted that there were two quite distinct races of elephants in Africa. The first (*Loxodonta africana oxyotis*) had rather triangular ears, while in the second (*Loxodonta africana cyclotis*) they were definitely rounded. Matschie thought these sub-species belonged respectively to East and West Africa, but it has since been shown that actually both types are spread over most of Africa, the pointed-eared elephant preferring to live in the savannah or bush, while the round-eared one chooses the forest. Moreover the first is much larger than the second. A male bush elephant often stands more than 11 feet high and may occasionally reach as much as 12 feet 8 inches, while the male forest elephant is never more than 10 feet high and is generally about 8 feet. The first has light-grey rough-looking skin and tusks tending to point outwards, while the second has dark-grey smooth-looking skin and tusks which tend to point more inwards. Moreover the bush elephant has only four toenails on the fore-feet and three on the hind-feet, while the more primitive forest elephant has five on the fore-feet and four on the hind-feet.

They are thus so different that Glover M. Allen has considered that



93. Forest elephant compared with the larger savannah elephant. Note the different shape of the ears.

they are actually different species, and that the savannah elephant (by the law of priority) should be called *Loxodonta africana*, and the forest elephant *Loxodonta cyclotis*. These two species do not seem to keep strictly to their respective habitats. On 19 May 1938, when he was exploring the Albert National Park in the Belgian Congo, Dr Serge Frechkop happened to see two herds of elephants feeding close to one another only 100 yards or so from his camp at Ishango north of Lake Edward:

> One of these herds consisted of larger elephants with brownish-grey skin; the other included individuals measuring about three-quarters of the height of the specimens in the first herd and having skin of a blackish dark brown colour. The two herds moved side by side without mingling with one another.

Although he could not get close enough to examine the shape of their ears, he was convinced that one herd consisted of *Loxodonta africana* and the other of *Loxodonta cyclotis*.

Besides these two there seems to be a third much more controversial species, the pygmy elephant, in which the adult does not exceed 6 feet 6 inches at the withers. There is no doubt that such elephants exist. Specimens have lived in the Antwerp and New York zoos, but some

zoologists maintain that this does not prove they are separate species (like those once found on Malta and other Mediterranean islands); they may merely be the freak offspring of normal elephants. It is often difficult to distinguish between true pygmies and pathological dwarfs. To settle the question one would have to observe the reproduction of pygmy elephants or prove that there are whole herds of them.

The pygmy elephant was first officially described in 1906 by a German professor, Theodore Noack of Brunswick from a specimen which was six years old and came from Ndjolé in Gabon. He called it *Loxodonta pumilio*. In 1923 Hornaday reported it in the same area, around Lake N'Gobi, 80 miles south-east of Fernan Vaz, and in 1926 Pohle reported it in Fernan Vaz itself. Not long ago Professor Bourdelle, one of the world's greatest experts on mammals, and Francis Petter published a remarkable study of a pygmy elephant, killed on 11 March 1948 at Aloombé on the coast of Gabon between Libreville and Port-Gentil. It was a solitary old male, thought to be very aged. It was barely 6 feet 5 inches high. Lucien Blancou, who has made a careful study of the mammals of French Equatorial Africa, notes that the negroes make a clear distinction between the pygmy elephant and the larger species; he remarks that it is usually hairier than the ordinary elephant and he is convinced that it is a distinct animal.

In the Congo the pygmy elephants are often said to be aquatic. A settler living near Lefini in the Upper Congo area, showed Hans Schomburgk a piece of thick skin like an ordinary elephant's but covered with a fleece of reddish hairs. He said it came from an animal which the natives called "river-elephant" and which had amphibious habits like a hippopotamus. There were persistent rumours all round Lake Leopold II about this curious animal, but Schomburgk was unable to find out the truth of them himself.

In 1911 Professor Trouessart reported that a certain Le Petit had seen five of these water-elephants at Tomba-Mayi on the north bank of Lake Leopold II, in the Loukeni region of the Belgian Congo. Their trunks and ears were remarkably short but their necks, on the other hand, were longer than an ordinary elephant's, and they were not more than 6 feet 6 inches high. At the sight of man they jumped into the water, leaving only their trunks and the crowns of their heads above it and swam out into the lake.[1]

Dr Henri Schouteden, Director of the Congo Museum at Tervueren in Belgium, thought that Le Petit must have been "the object of a

[1] Le Petit's elephants will be discussed in greater detail on pp. 472–4.

complete illusion and that the natives, as often happens in the Congo, had given a free rein to their imagination." He was soon to change his mind. Lieutenant Franssen, a Belgian officer, had promised to make a systematic search for the animal and send a specimen to the Museum at Tervueren. "If the animal exists," he said, "I will come back with it; otherwise I shall not come back at all."

Lieutenant Franssen came back, as he had promised, with the remains of a water-elephant captured "after spending thirty-six hours in mud and water." Exhausted by his sufferings on this expedition, and shaken with violent fever, he did not long survive his return. Dr Schouteden named the water-elephant, or *waka-waka* as the natives called it, *Loxodonta fransseni* in his honour. Although his specimen was one of the largest in the herd it was only 5 feet 5 inches at the withers. Its tusks were 2 feet 2 inches long and together weighed under 43 pounds. They were thus considerably longer than those of an ordinary elephant of the same size, as Dr Schouteden points out.

According to him the shape of the ears and the fact that there are two finger-like appendages on the tip of the trunk (*L. pumilio*, like the Asian elephant, is supposed to have only one) are enough to justify a new species of pygmy elephant. Personally I cannot see much difference in the shape of the ears in photographs of *L. pumilio* and *L. fransseni*, and I find it hard to believe that there are any elephants in Africa with only one finger on the tip of the trunk. It is more likely that *L. fransseni* is merely a synonym for *L. pumilio*—which is hard luck on Lieutenant Franssen.

Pygmy elephants have been reported in other widely separated parts of the Belgian Congo, where they do not seem to be particularly amphibious. In 1932, Major P. Offerman, director of the elephant-taming station at Gangala-na-Bodio, reported that two pygmy elephants had been captured in the Api (Uelé) area. They measured 4 feet 3 inches and 4 feet 9 inches at the withers, but had "long and stout tusks almost touching the ground." The natives called them *abele* as distinct from *tembo*, the larger elephant.

A.-J. Jobaert, an honorary assistant game-warden in the Belgian Congo, several times saw pygmy elephants in the Lusambo province, and thinks that this species lives in "all the large forests in the northern territory of the province." These little elephants were never more than 6 feet 6 inches high and they always travelled "in fairly large herds."

Glover M. Allen maintained in 1936 that pygmy elephants (*L. pumilio* and *L. fransseni*) are merely forest elephants (*L. cyclotis*) which are not

yet fully grown. All the same there is no doubt that adult pygmy elephants exist which are less than 6 feet 6 inches high. The specimen at the New York Zoo, whose growth Dr Hornaday followed to the end, reached a height of only 6 feet 5 inches and a weight of 1 ton 2½ cwt. An adult of the larger species weighs between 5 and 7 tons. The evidence I have already cited shows that there exist small groups and even large herds of pygmy elephants, so that Allen's view is hard to maintain today. Bourdelle and Petter also point out that the pygmy elephant appears to have a habitat of its own:

> Up to the present the pygmy elephant has appeared to be mainly an inhabitant of the African rain-forest, and especially the marshy parts of it; this seems to justify its name of "water-elephant" which the population often give it and which certain authors have used in their turn.

Thus there are three species of elephants in Africa, corresponding to three different habitats: the bush elephant, naturally the largest and with the most developed ears, as is usual with animals that live in fairly open country; the forest elephant, smaller, darker and with rounder ears; and the marsh elephant, even smaller and hairier. (In this respect it is like the Negrillo pygmies which differ from the other negroes in the same way; perhaps a moist jungle habitat causes these racial differences.) The size of the adults seems to range roughly between 5 feet and 6 feet 6 inches in the pygmies, between 6 feet 6 inches and 10 feet in the forest elephants, and 10 and 13 feet in the bush elephants. There is no gap between the species, which has always made it difficult to tell them apart. But to deny that the pygmy elephant exists, even as a sub-species of *Loxodonta cyclotis*, shows a most obstinate prejudice. W. R. Foran, a British big-game hunter, has even affirmed that the pygmy elephant was invented by ivory-traders. It is forbidden to kill elephants that are not full-grown, so when poachers shoot a young one they pretend it is a pygmy.

Many zoologists are still no less incredulous, but with no justification, especially when one recalls how ready they are to create new species or sub-species, distinguished only by the slightest difference in colour or a few extra whiskers.

The reader may feel that the evidence for the pygmy rhinoceros is too vague and that the pygmy elephant is too well-established to be unknown. No such objection can be made against the *marozi*, the little spotted lion of the Kenya mountains.

Colonel R. Meinertzhagen, who was the first to collect remains of the giant forest-hog, heard of it several times between 1903 and 1908, but not until 1931 was any more official notice taken of it. Then Captain R. E. Dent, a Kenya game-warden in charge of the Fisheries section, saw four of these large cats crossing the path in front of him, between 10,000 and 11,000 feet up, near the sources of the Kathita above Meru. They seemed to him smaller than ordinary lions and of a very different type. No doubt he would have forgotten about it if a few months later his boys, who had set leopard-traps all along the eastern slopes of the Aberdare Range, had not come and told him excitedly that they had caught an unusual animal. It was neither a lion nor a leopard, but a sort of cross between the two. Unfortunately for some unknown reason they were not able to bring the specimen back.

A little later a white farmer called Michael Trent shot two small lions with strange fur which had been attracted by a waterbuck that he had fixed as bait some 10,000 feet up in the Aberdares. He was not a naturalist and did not think their peculiar appearance was important. Luckily an official in the Game Department happened to see the skins preserved as trophies and thought them so unusual that he at once took them back to Nairobi to Captain A. T. A. Ritchie, then Chief Game-Warden, who recognised that there was something unusual about them (see photograph facing page 368). They were those of a lion and a lioness, for one of them had a mane, though it consisted of little more than side-whiskers.

From their size they seemed to belong to lions at least three years old—the age of puberty—which was perhaps confirmed by the fact that they were a lion and his mate. But their skins were spotted. Now lion-cubs are always born with fur speckled with fairly faint spots, but these usually disappear quite soon and have quite gone before they are three years old. These skins were clearly spotted, and the spots showed not the slightest signs of fading. But without a complete skeleton, or at all events a skull, which could have definitely established the specimen's age, it was hard for the Game Department officials to give a verdict.

It was recalled that in 1924 the late Blayney Percival, a famous game warden and a brilliant naturalist, reported he had killed a lioness and her cubs which were all very clearly spotted. Might not some individuals retain their juvenile spotted coat until later than usual? It was best to be cautious. But Kenneth Gandar Dower, a big-game hunter who also examined the skins, was more positive about them:

They appear to belong to lions two or three years old—the male had a whiskery mane—and yet the cub spots with which almost every lion is born showed no signs of fading. Certain freak lions do keep their spots to an advanced age, but not in a degree comparable with these rosettes which were distributed not only on the legs and flanks but right up to the spine itself . . .

They so convinced Gandar Dower that there was a separate species of spotted lion, that in 1933 he organised a safari to try to find a specimen of this unknown animal. He found nothing but some footprints too large for a leopard's and too small for a lion's; nor could they be mistaken for a young lion's.

Undaunted, he published an exciting book about the spotted lion in 1937. It made a good deal of noise in the British Press and brought to light more evidence, the most interesting of which came from G. Hamilton-Snowball, who had an interesting adventure in the Aberdare Range. In a letter to the *Field* he recalls that one day when he had shot an animal he took for a leopard, although it was unusually large and dark in colour, his Kikuyu boys told him that it was a *damasia*, not a *chui* (leopard), and that it was as different from a leopard as a lion from a *marozi*. When he asked them what a *marozi* was, they at once replied that it was an animal smaller than a lion, which one usually met in pairs, though this happened rarely and only at high altitudes. It was spotted. Hamilton-Snowball adds:

Later, in the spring of 1923, I crossed the Aberdares on foot from Laikipia to N'jabini on the Kinangop plateau and on the second day out, about 4 p.m. in poor light (it was drizzling a bit) at 11,500 ft. I saw what I thought at first were two very tawny and washed out looking leopards about 200 yards away.

As I turned to my bearer for my rifle (I had been carrying a shot gun) I heard an unfamiliar name being excitedly murmured by all the boys, who had seen the beasts as soon as I had.

"Marozi, Marozi," they repeated. As I pushed off the safety catch, with one movement, the beasts (or cats) turned and in two bounds had gone into the belt of forest in front of which I had surprised them.

By now I remembered what Marozi meant and asked the boys if they thought it was likely a couple of lion would ever come up from the plains to such a height and in such cold conditions! "Certainly not," they said, "but Marozis live here!"

Well, I can only say or tell of what I had seen and I must add that the "pugs" certainly were those of lion, and not of leopard, that the beasts looked spotty and tawny, but except for the natives, I never could get confirmation that there even were such things as "spotted lions."

An inquiry among the Kikuyu confirmed that they did in fact make a clear distinction between *simba*, the lion, and *marozi*, the little spotted mountain lion.

Raymond Hook, the hunter who accompanied Gandar Dower's expedition and whose knowledge of the high parts of Kenya seems to be unique, thinks that the *marozi* is largely mythical, but adds that in theory it is not impossible that a small race of lions, descended perhaps from lions which took refuge in the forest when the plains were colonised, might survive in a few confined areas. This sub-species, if it exists, would have undergone a change in colour to suit its new environment. But Hook thinks that there is not enough evidence to prove its existence.

Other experts are less cautious. Powys Cobb of Elementeita, who knows African big-game well, is convinced that a species unknown to science lives in the thick and little-explored Mau forest. He surprised a strange beast of the cat tribe, between a leopard and a lion in size, which had attacked cattle grazing in a corner of his farm near the edge of the forest. He mounted his horse and pursued the animal into the forest, where he had to give up the chase without having come any nearer to it. Its footprints were like a small lion's.

These two opinions were quoted after Gandar Dower's death, by another East African settler, J. R. T. Pollard, who had known him well during the last war. Pollard also writes:

> My own view, based on talks I have had with Kikuyus, many of whom assert that lions occasionally visit the high moors of Mount Kenya, is that it is quite possible that an unknown member of the cat tribe inhabits the upland rain forests, for large areas have never been visited by man.

The natives of Embu told Major G. St. J. Orde-Brown about "a lion-like forest cheetah" on the south-eastern slopes of Mount Kenya. There is no doubt that this is our "spotted lion," for the cheetah is like the lion in outline: both have high shoulders and usually walk with the head raised, while the leopard holds its head farther forward and lower than its shoulders. No doubt this is because the lion and cheetah are animals of the savannah, while the leopard and tiger usually live in forests; and animals living in tall grass have more need to lift their heads to get their bearings than those which slink through bushy undergrowth.

E. A. Temple-Perkins, a big-game hunter who is usually inclined to be sceptical about unknown animals, tells of a similar animal called *ntarago*, in which he is inclined to believe, having heard its voice.

Skin of the spotted mountain lion shot by Michael Trent.

Lion-cub showing the spots on its juvenile coat which later vanish.

The *nsui-fisi*, which was thought to be a cross between a leopard and a hyena proved to be a freak variant or possibly new species of this cheetah.

The voice I heard that evening at Kichwamba was strangeness itself, and beyond my power to describe with sufficient accuracy, although I heard it at ranges of about one mile to fifty yards from my camp intermittently for two hours. All I can say is that it sounded harsh and guttural; it was not the cough of a leopard, but more like that than anything else if you add the word liquid or gurgling.

Four natives, one of them an old and trusted tracker, all independently told Temple-Perkins that it was the *ntarago*. He was unable to catch sight of the beast in the firelight, nor could he find any spoor. All the same he is very insistent that animal is a feline, and is quite emphatic that it has nothing to do with another frequently reported animal, the giant hyena.

For some fifty years, then, rumours have been current about this strange cat in Upper Kenya above Meru, despite the scepticism of some experts who maintain that it is merely an ordinary lion that has retained its juvenile spotted coat. Each witness has reported the same features: the size is smaller than an adult lion and nearer that of a cheetah, the spots are like a leopard's, and there is little or no mane.

Most naturalists are apt to be reserved about the spotted lion's existence, but not ill-disposed to it. Reginald Pocock, a great authority on the felines, is distinctly favourable, and brings grist to Gandar Dower's mill:

> There is, as a matter of fact, some independent evidence, unknown to Mr Gandar Dower at the time, of the evidence of a small lion in Kenya. Several years ago, Messrs. Rowland Ward showed me the skulls of an adult lion and lioness received without skins or more precise locality from that Colony. Their unusually small dimensions puzzled me a good deal. The skull of the lion was less than ½ an inch longer than the longest lioness's skull, from Laikipia, in the Washington collection, and the same width; and the skull of the lioness was nearly 1 in. shorter and over ½ an inch narrower than the smallest lioness's skull, from Kapiti, in the same collection.
>
> Since these skulls are decidedly smaller, sex for sex, than any out of the very large numbers that have been measured from many localities in the plains of East Africa, it seems probable that they came from some place in Kenya where few sportsmen have shot and preserved lions. That place may have been the mountain forests of the Aberdares . . .

Colonel C. R. S. Pitman, a game-warden and one of the most knowledgeable experts on African fauna, writes:

> The evidence, so far, is inconclusive, though there is no reason to discredit the probability of a small race of lion occurring permanently

at these high altitudes [10,000 and 11,000 feet]. My own ideas support the claim that a small mountain race does exist in Kenya.

The sceptics are less convincing. G. Flett of Aberdeen attempts to explain the *marozi* as an optical illusion:

> On two occasions during my two years' continuous stay in the remoter parts of Kenya, I met with lions at very close range during the middle of the day; on both occasions the bodies of the animals were patterned by the shadows thrown by the tree branches and the shadow effect was indeed striking. I thought then that I had seen a species of lion unknown to science and I can well understand how Mr Pollard's friend was deceived.

But how does he explain the fact that Michael Trent's lions did not change their spots even after they were shot, skinned and examined by numerous naturalists?

Major W. R. Foran, whose sceptical views about the pygmy elephant we have already heard, takes the line in an article on "The Legendary Spotted Lion" that it is not a new sub-species, while adducing evidence to the contrary!

> On two different occasions in 1906 I shot a lion and a lioness on the slopes of Mount Kenya, each definitely not younger than five years old; the spotting was clearly visible on belly, flanks and legs. Both were somewhat smaller than the average lion and the male was quite maneless. It struck me that these animals were abnormal in the retention of their spotting, but were possibly a rare occurrence.

What makes him think these were individual freaks and not members of a different race? Elsewhere he makes a remark which contradicts this point of view:

> There is nothing unusual in lions being found at such high altitudes: they are customarily styled "forest" lions, and on average, they are smaller than normal beasts found on the plains at lower altitudes.

Certainly it is not unusual to find lions on mountains, but to find them in thick forests like those on Mount Kenya is quite extraordinary. The lion is an animal of the savannah. It never ventures into thick forests. So if one finds lions in such forests they must therefore be a very special kind of lion. Since racial differences are always shown in differences in form and colour, it would be quite normal for forest lions to be smaller and have a spotted coat. As Dr Serge Frechkop has noted about leopards, "there is as a general rule a type of larger size with a lighter coat in the savannah, and a type of smaller size with a darker coat in the forest." Why should not this also be true of lions?

Major Foran does not explain the legend of the *marozi* very convincingly. He recalls that zoologists allow only two varieties of lion in East Africa, the Masai lion (*massaica*) and the Somali lion (*somalica*). The second is smaller, has practically no mane but larger ears; it is always of a lighter fawn, almost cream-colour. Perhaps, he suggests, the Somali lion has come into Kenya and settled there. But he seems to forget that the Somali lion like the other lions, but unlike the *marozi*, is not supposed to retain its juvenile spots when it is fully-grown.

In any case these varieties of African lions need some qualification. Dr Frechkop remarks that:

> It does not seem that today one can distinguish more than *one species* of the genus *Leo*, unless perhaps the differences between the African lions and those which are still preserved in a region of India are considerable enough for the latter to be treated as a species (*Leo goojratensis*) different from that which lives in Africa (*Leo leo*).
>
> As to the African lions, it is certain that there are fairly marked differences between the lions found in Algeria [*Leo leo leo* (Linn.), the Atlas or Barbary lion] and those found in Cape Colony, called *Leo leo capensis* (Fischer) or *Leo leo melanochaitus* (H. Smith), as well as between those which live in Senegal—*Leo leo senegalensis* (Meyer)—and those in East Africa.

Dr Frechkop goes on to deplore the creation of a host of sub-species which he considers to be "the exaggeration of systematicians who do not take into account the animals' life, nor the complex play of heredity and individual variation." "I am far from denying that these names may refer to different races," he writes, "but it is also necessary that *each specimen* from one region should have the characteristics attributed to the race belonging to that region." And he goes on to show that even in the Albert National Park in the Belgian Congo there are two extreme types, with every possible intermediate form: one is a lion with an undeveloped mane, confined to the neck and consisting of tawny hairs with only very few blackish ones; the other has a thick dark mane, reaching beyond the shoulders and even under the front legs where it forms tufts on the elbows. Obviously this is not a case of separate races but of individual variations. As most of the sub-species of lions are based on such slight characteristics as the relative size of the mane or the relative colour of the fur, I doubt whether they have much value. Yet, paradoxically enough, the same systematicians who are so ready to create new species on such trivial data, refuse to admit that the spotted lion is a separate variety, even though the differences observed in its size and marking are so distinct that they may well justify the

creation of a new species, which could have no better name than *Leo maculatus*.

At all events there is little doubt that a race of lions with juvenile characteristics could have arisen in Kenya, where it has taken refuge in the thick forests at high altitudes. Cut off there from the lions of the plains, they must have undergone considerable changes as a result of the phenomenon of segregation. From all accounts they seem to have dwindled appreciably, for they are generally said to be between the size of a lion and a leopard. If a large lion (omitting the tail) is 5 feet 3 inches long, and a large leopard is 4 feet, an adult spotted lion would be about 4 feet 8 inches from the tip of the nose to the root of the tail. Perhaps its size is even smaller, since it has several times been compared to a cheetah, which rarely exceeds 3 feet 3 inches, in which case one could clearly call it a "pygmy lion," and, like the pygmy forms of hippopotamus (*Choeropsis*), rhinoceros (*Dicerorhinus*), siamang-gibbon (*Hylobates klossi*) and chimpanzee (*Pan paniscus*), it would deserve to be raised at least to the status of a new species. Its exact position in the zoological scale cannot be settled until its skeleton and perhaps also its internal anatomy have been studied. And we have yet to capture a specimen.

CHAPTER SEVENTEEN

The Nandi Bear, an East African Proteus

Shouting we seize the god: our force t'evade
His various arts he soon resumes in aid:
A lion now, he curls a surgy mane;
Sudden, our hands a spotted pard restrain;
And last, sublime, his stately growth he rears,
A tree, and well-dissembled foliage wears.
ALEXANDER POPE'S translation of HOMER'S description of Proteus.

THE bravest native hunters in Kenya will tremble at the name of the *chemosit*. Men who are not afraid to meet a lion with no weapon but a spear, turn back at once if they come upon its footprints. It is said that no one who has heard its hideous cry ever forgets it. But if you ask a settler, whether he be game-warden or professional zoologist, about this nightmarish creature, he will give you nothing but vague theories, a frank denial or a sceptical shrug of the shoulders. Yet it would need a whole book to detail all the tales told by whites and negroes in British East Africa and the neighbouring part of the Belgian Congo about a sort of large "bear" of unparalleled ferocity. The British call it Nandi bear, from the name of the people in whose territory it is chiefly found.

Now the odd thing is that there is virtually not a single species of bear in the whole African continent.[1] Of course there is no certainty that the Nandi bear is really a bear, but it looks like one; and the features reported by numerous witnesses are so characteristic that it seems a

[1] The only possible exception is a variety of brown bear (*Ursus arctos crowtheri*) which may still survive in a small corner of Africa nearest to Europe, Spanish Morocco, though many authorities think that it is now extinct. It is a descendant of bears that came from Spain before the Straits of Gibraltar joined the Mediterranean to the Atlantic.

reasonable supposition. Moreover, despite the total absence of bears in black Africa, the Wa-Swahili and the tribes bordering the River Tana have long used the word *duba*, presumably derived from the Arabic *dubb* (bear), to describe a fearful beast that haunts the forests along the river.

Ancient accounts of travels sometimes mention bears even in the heart of Africa. Herodotus, who was always scrupulous, reports that in Libya there were "huge serpents [pythons] . . . the lions, the elephants, the bears, the asps, and the horned asses. Here too are the 'dog-heads' [baboons]" and many other animals of the local fauna. Pliny, on the other hand, disputes the existence of bears in Africa. But in his very detailed description of Africa, Dr Dapper, who renewed our knowledge of the continent in 1668, writes that in the Kingdom of Congo "there are squirrels which have tails much larger than those in Europe, bears, wild cats, snakes and very venomous vipers. . . ."

In the centuries that followed, all naturalists agreed that there were no bears in Africa. It was not until 1905 that Europeans first saw what came to be known as the Nandi bear on the Uasin Gishu tableland; and their accounts were not published until there was a particularly persistent crop of rumours in 1912. Geoffrey Williams, who had taken part in the famous Nandi Expedition at the beginning of the century, wrote with apparent reluctance in the *Journal of the East Africa and Uganda Natural History Society*:

> I am asked to describe the strange beast that I once saw up on the Uasingishu, and it is with some diffidence that I make the attempt since experience has taught me that descriptions of unrecorded animals do not meet with much credence.
>
> However, as I now hear that it has been seen again, I feel encouraged to do the best I can.
>
> Several years ago I was travelling with a cousin on the Uasingishu just after the Nandi expedition, and, of course, long before there was any settlement up there. We had been camped on the edge of the Escarpment near the Mataye and were marching towards the Sirgoit Rock when we saw the beast. There was a thick mist, and my cousin and I were walking on ahead of the safari with one boy when, just as we drew near to the slopes of the hill, the mist cleared away suddenly and my cousin called out 'What is that?' Looking in the direction to which he pointed I saw a large animal sitting up on its haunches not more than 30 yards away. Its attitude was just that of a bear at the 'Zoo' asking for buns, and I should say it must have been nearly 5 feet high. It is extremely hard to estimate height in a case of this kind; but it seemed to both of us that it was very nearly, if not quite, as tall as we were. Before we had time to do anything it dropped forward and shambled

away towards the Sirgoit with what my cousin always describes as a sort of sideways canter. The grass had all been burnt off some weeks earlier and so the animal was clearly visible.

I snatched my rifle and took a snapshot at it as it was disappearing among the rocks, and, though I missed it, it stopped and turned its head round to look at us. It is in this position that I see it most clearly in my mind's eye. In size it was, I should say, larger than the bear that lives in the pit at the 'Zoo' and it was quite as heavily built. The fore quarters were very thickly furred, as were all four legs, but the hind quarters were comparatively speaking smooth or bare. This distinction was very definite indeed and was the first thing that struck us both. The head was long and pointed and exactly like that of a bear, as indeed was the whole animal. I have not a very clear recollection of the ears beyond the fact that they were small, and the tail, if any, was very small and practically unnoticeable. The colour was dark and left us both with the impression that it was more or less of a brindle, like a wildebeeste, but this may have been the effect of light.

The mist had entirely lifted and the beast stood out quite plainly against the rocks. Unfortunately I had no second cartridge ready, and it had vanished before I could get another shot. Owing to the extreme hardness and dryness of the soil at the time and the number of stones there was no definite spoor to follow, and though we sought for it for some time we never saw it again.

When Williams asked the boy who had been with him to pick out the beast from a book full of illustrations of animals, he plumped for the brown bear. Another Nandi boy confronted with Kipling's *Jungle Book* identified Baloo, the Indian bear, as *chemosit*, a beast whose description Williams found tallied with the unknown animal he had seen.

I have also heard [Williams adds] of the same thing in the Kakumega country near Kabras [about 20 miles south of the Uasin Gishu], and was twice warned by the people not to sleep with my tent door open for fear of the 'Shivuverre,' which they describe as a nocturnal beast something like a hyæna only infinitely larger and very savage. I heard of a skin in Kabras and tried very hard to obtain it; but could not do so.

The Nandi say that they once killed one years ago owing to its having climbed upon the roof of a hut and broken through.

It killed the people in the hut, but others burnt the place down with the animal inside. They say the reason it is never killed is because it is entirely nocturnal, is very rare, and only attacks solitary people, who never return to tell the tale.

When I saw it, it was quite early in the morning, and the Nandi account for its being about at that hour by the fact that the mist prevented its realising the approach of daylight.

I might add that the beast was not the least like either a baboon or an ant-bear, of this I am quite certain.

The tales which were current when this very circumstantial account was published are strangely confusing, and the reader may well be puzzled to find me citing reports which unquestionably refer to different animals. But these discrepancies are a vital part of the problem. Too many authors have picked out a set of consistent reports, discarding the others, in order to prove that it is some known animal. On the other hand it is only right to point out that the settlers invented the name Nandi bear on the slender grounds of their first observations of it and that they were gradually led into using it for any mysterious—or apparently mysterious—animal they failed to recognise.

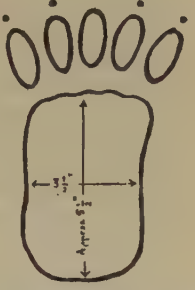
A whole set of reports were collected by the British anthropologist C. W. Hobley. The first comes from Major Toulson, a well-known settler on the Uasin Gishu, to whom the following incident occurred in 1912:

> It was getting dark when one of my boys came into my room and said that a leopard was close to the kitchen. I rushed out at once and saw a strange beast making off: it appeared to have long hair behind and it was rather low in front. I should say it stood about 18 in. to 20 in. at the shoulder; it appeared to be black, with a gait similar to that of a bear —a kind of shuffling walk. Unfortunately it was nearly dark at the time and I did not get a fair view of the head.
>
> Several Dutchmen had asked me a few days before what the strange animal was on the plateau; they said it was like a bear, but they had only seen it at dusk; it turned on their dogs and chased them off. They described it as a thick-set beast and it was making a peculiar moaning cry.

In March 1913 N. E. F. Corbett, the District Commissioner of Eldoret, saw what he thought was the Nandi bear.

> I was having lunch by a wooded stream, the Sirgoi River, just below Toulson's farm, and afterwards went a little down-stream to fish, and to my surprise I walked right into the beast. It was evidently drinking and was just below me, only a yard or so away. I heard something going away and it shambled across the stream into the bush. The place was overgrown and I was without my specs, so could not get a very good view, but am certain that it was a beast I have never seen before. Thick, reddish-brown hair, with a slight streak of white down the hind quarters, rather long from hock to foot, rather bigger than a hyena, with largish ears. I did not see the head properly; it did not seem to be a very heavily built animal. The annoying thing was that I had been past exactly the same place half an hour before with my gun after a duck, and when I returned I had nothing but a fishing-rod. I saw it about 12.30 midday—almost the same time that Mr. Kennet saw one at another place.

The next reports come from people working on the Magadi railway, which was being built at this time. They all say that they found footprints of a strange animal on the rough track which they had cleared before beginning to lay rails. One of them, called Schindler, who discovered particularly clear prints in the dried mud where a pipe-line ran out, drew a sketch which is reproduced here.



94. Footprint of the "strange beast" found by Schindler on the Magadi railway.

An engineer called Hickes who was in charge of building the railway also ran across the animal. It was his account which led the previous witnesses to recall their own encounters.

On March 8, 1913, I was travelling alone on our motor trolley along the Magadi Railway. At about 9 a.m., when I was at Mile 16, I saw, about fifty yards ahead of me, what I took to be a hyena.

It was almost on the line when I first saw it and at that time it had already seen me and was making off at a right-angle to the line—which is straight at this point.

I wondered at seeing a hyena out so late in the morning, and looked at it with interest, especially as, owing to the speed I was travelling (about twenty-five miles per hour) I should pass so close to it before it had time to get away.

There had been heavy rain the night before but at the time I saw the animal it was clearing up, although the sun was not shining.

The country is quite open, with grass about eighteen inches high, and the ground is 'black cotton,' with many projecting whinstone boulders.

As I got closer to the animal I saw it was not a hyena. At first I saw it nearly broadside on: it then looked about as high as a lion. In colour it was tawny—about like a black-maned lion—with very shaggy long hair. It was short and thick-set in the body, with high withers, and had a short neck and stumpy nose.

It did not turn around to look at me, but loped off—running with its fore-legs and with both hind legs rising at the same time.

As I got alongside it, it was about forty or fifty yards away, and I noticed it was very broad across its rump, had very short ears, and had no tail that I could see.

As its hind legs came out of the grass I noticed the legs were very shaggy right down to the feet, and that the feet seemed large and were, of course, covered with black mud.

I could not at all think what animal it was, and it was only after I was actually past that I realised that it must be the strange beast of which we had all heard, and which has been seen several times during the construction of this railway.

Directly I realised what I had seen my first impulse was to go back, especially as I had a .350 Rigby with me.

I could still see it loping away, but I remembered that a slight wash-away had been reported at Mile 29, and our engines were held up and waiting for me to get them through.

I therefore went on, intending to stop on my way back and take careful measurements of the spoor. Unfortunately, however, when I was returning in the afternoon very heavy rain was on, so I did not stop, as nothing would have been left of the spoor, the whole country being under water.

This strange beast was first mentioned to me by Mr. Clifford Hill, who, on the first survey of this railway, had a young Dutch boy with him who came across one on the Koora Plains (Mile 71).

He had seen nothing like it and could not describe it, so Mr. Hill showed him a picture-book of animals, and he picked out the bear as being like the animal he had seen.

The first we heard of it during construction was when we had our pipe-line discharging water to waste at about Mile 71. Several engineers saw a strange spoor in the mud so formed—all the rest of the country being dry. It has been sketched to me and described as that of a bear. [See Fig. 94.]

A native servant of one of the engineers, Mr. Archibald, also reported that he saw this strange animal, which, he says, stood on its hind legs and looked at him, but would not run away.

The only other instance of its actually having been seen is reported by a sub-contractor, Mr. Caviggia, who saw one at Mile 38, and his description is very similar to mine.

I have been in Africa—East, South, and West—in the wilds in advance of civilisation, building railways during a considerable part of the last eighteen years, and I cannot think of any animal I have not seen in its wild state, but I have never before seen anything like this beast.

The last of Hobley's reports does not seem at first sight to refer to the animal in question.

There are also stories of another unknown beast from the lower and middle valley of the Tana River. Mr. Cumberbatch, the District Officer of that region, tells me that the German missionaries who have lived for many years at Ngao state that the Pokomo natives know of a forest beast called the 'Koddoelo,' and is said to have been killed near Ngao some years back. On one occasion one of the missionaries found that the whole population of the biggest Pokomo settlement in Kina Kombe district had deserted their village and crossed the river because this animal was roaming about in the bush near the village.

The animal was described to the District Officer by a Pokomo (who, however, admitted that he himself had not seen it) as being as large as a man, as sometimes going on four legs, sometimes on two, in general appearance like a huge baboon, and very fierce. The Pokomo native is

not a highly strung or imaginative person, so it is possible that there is some undiscovered anthropoid beast in the dense bush which is found in the Tana Valley.

An "undiscovered anthropoid beast" may seem a long way from a "bear," but in fact the Nandi think the *chemosit* is more like a large monkey.[1] And when Hobley soon afterwards received further details about the *koddoelo* from a Mr Rule who had made a thorough inquiry among the Wa-Pokomo, he published a description which agrees in many details with that seen by Hickes beside the Magadi railway.

> Colour, reddish to yellow; length, about 6 feet; height, about 3 feet 6 inches at the withers; hair long, and all accounts agree on the point of a thick mane; tail short and very broad; claws very long; head, fairly long nose, teeth long but not so long as lion; fore-legs said to be very thick.
>
> The Pokomo state that several have been killed, and one man says that he killed one himself a good many years ago. It is said to be very fierce, and to visit villages and carry off sheep. On these occasions the natives either cross the river until it leaves the neighbourhood or frighten it away by beating drums. The Waboni hunters know the beast well, but say that they prefer to leave it alone.

Hobley goes on to give further information which comes even nearer, in some details at least, to the descriptions of the alleged Nandi bear.

> The Assistant District Commissioner on the Tana also sends a further account of the animal, based on recent inquiries, and it was described to him by Pokomo, who said they had seen it, and their account was as follows:—Light in colour, long hair on neck and back, usually goes on fore-legs but can go on its hind-legs, not known to climb trees, rather smaller than a lion, tail about 18 inches long and some 4 inches broad, is nocturnal in its habits, fore-legs very thick; said to leave a track with one deep claw mark behind the marks of its four toes (this is rather obscure).[2] They are agreed about its ferocity and say it attacks a man on sight. One is said to have killed a rhino near Makere, but this is rather difficult to credit. One tried to raid a goat kraal last January, but was driven away by the noise made by the villagers when the alarm was given.
>
> The Wa Pokomo are an agricultural people on the river and do not

[1] Further south, in the very north of Tanganyika, the local monster is even more ape-like. Captain Hichens calls this *ngoloko* "the man-ape of the Isansu hills, a weird creature that prowls the dismal stretches of Yaida Lake."

[2] Perhaps it should be "beyond the marks of each of its four toes," or it may mean that there is a mark of a fifth toe, bent and perhaps opposable like a thumb, possibly more deeply impressed, further back on the foot. In the latter case the beast must indeed be an ape or baboon.

usually hunt, but Waboni hunters might possibly be induced to locate one if anyone had leisure and means to devote to the matter.

As the rumours grew all over Kenya, people began to interrogate the natives to find out whether they knew any bear-like creature, and little by little it began to appear that an animal like one in some respect or another was well known to the natives since time immemorial. On the coast the Moslem Swahili peoples, who from long contact with Arabs had learnt of the existence of bears, had not been influenced by the whites in calling the mysterious beast by a name derived from the Arabic for bear: *duba*. In the uplands, beyond the reach of Arab influence, the Lumbwa name is *geteit* which means "brain-eater." This becomes *gereit*, *kereit*, *keteit* or *kerit* on the slopes of the Mau escarpment and in the Nandi country, where it is also called *chemosit* and *chimiset* or "the devil." In Ruanda this is altered to *ikimizi*, though other parts of the same country use the quite different name of *kikambangwe*, The Ba-Gishu and Sabai of Mount Elgon call it *sabrookoo*.

But, whatever the name, there is no doubt that the native descriptions are often very exaggerated, or perhaps one should say poeticised. Ali, Roger Courtney's guide, speaks of it as "great, white and hairy, that walks upright like a man and eats only the brain of its victims." The Nandi chief Kitapmetit Kipet described it to Captain William Hichens as "half like a man and half like a huge, ape-faced bird, and you may know it at once from its fearful howling roar, and because in the dark of night its mouth glows red like the embers of a log." Such tales were naturally taken for mere superstitions until white men started to see the Nandi bear and show that they might have a real foundation.

There seems little doubt that there is confusion in the Nandi mind between a real animal and a devil in their local mythology. Perhaps this is because they call the beast *chemosit* in a figurative sense, just as we call various animals, such as the predatory Tasmanian marsupial, by the name of "devil." In his standard work on *The Nandi, their Language and Folklore*, published in 1909, A. C. Hollis drew a fantastic picture of the local devil, some of whose features are apt to turn up in descriptions of the Nandi bear.

> There is also a devil called *Chemosit*, who is supposed to live on the earth and to prowl round searching to devour people, especially children. He is said to be half man, half bird, to have only one leg but nine buttocks, and his mouth, which is red, is supposed to shine at night like a lamp. He propels himself by means of a stick which resembles a spear and which he uses as a crutch.

Subsequently I. Q. Orchardson, a settler who had lived among the Kipsigis (another name for the Lumbwa) for 16 years, maintained that the *chemosit* should not be considered as entirely mythical.

> Among the Kipsigis one finds no belief that the *Chemosit* is a devil or spirit or god or man. The only reference to its being like a man is that some say that at a distance it looks like a huge man because it stands up on its hind legs. Even those who say it has only one leg say that it has no arms and that its footprint is something between that of an elephant and a rhino and insist very strongly that it is only an animal. A few old men even say that they have seen it at night and give descriptions—very wild ones but all quite unlike man or spirit, for they include fur, whiskers ("wawechik" = whiskers or antennae of animals and insects only). The crutch of Hollis's book is quite unknown here for they say how could an animal use a crutch. A curious detail is that the urine of the *Chemosit* is said to be so evil smelling that no man can stay near it. All the young men deny having seen it or knowing what it is like, but love to tell children and unsuspecting Europeans fancy tales of it.
>
> The name *Chemosit* however might not be said at night just as in the case of the Chief Witch Doctor. At night it was given another name, *viz. Gononet*, of which I do not know the derivation. *Chemosit* is a fairly common man's name and it is also used by mothers to make their children obey, e.g. "If you don't eat your food the *Chemosit* will come and eat you."

Because mothers frighten children with bugbears in our country, it does not mean that all bears are imaginary beasts. To the Nandi the *chemosit* seems to be sometimes a bugbear and sometimes a real bear—or at least a real animal rather like one.

When settlers tried to set about finding out what this animal was they could count on little help from the natives, who were all too apt to turn grey with fear at the mention of its name. "Anyone who has lived in a 'Nandi bear atmosphere,'" writes the game-warden C. R. S. Pitman, "cannot doubt the reality of the dread the brute inspires." Indeed it is supposed to be a more bloodthirsty monster than any other animal in Africa. Not only does it slaughter domestic animals, but every year it is blamed for the death of many natives found with their skulls smashed in or the top of the head literally torn off.

Charles T. Stoneham, a well-known big-game hunter who searched for the mysterious animal in the Mau forests, gives some details:

> Men told me it came down to the villages at night and murdered the inhabitants in their huts. It made its entrance through the roof, killed the occupants, and ate their brains. That was one of the beast's peculiarities; it ate only the brains of its victims. Women gathering firewood

in the forest would be missed, and later their bodies would be discovered, always minus the tops of their skulls.

One of the brute's tricks is supposed to be to lie along a low branch above a path and wait till someone comes past. Then with a savage blow of its great clawed paw it rips open his head and eats his brain.

Without going into the way the beast ambushes its victims, but relying only on the wounds it is said to cause, we can say at once that no cat kills in this manner. It is much more like that of a large bear, which would generally stand up to its full height and use its powerful claws to hit its adversary, very likely scalping him as if he were a man. The cats on the other hand almost always finish off their victims by crunching their teeth into the nape of the neck or the small of the back.

In 1919 a farmer in the Lumbwa country called Cara Buxton told a circumstantial story which may perhaps provide the key to this particular problem:

> A short time ago a 'Gadett' [obviously the same word as *geteit*] visited this district. This name is given to the animal by the Lumbwa and signifies the 'brain-eater.'
>
> Its first appearance was on my farm, where the sheep were missing. We finally found all ten, seven dead and three still alive. In no case were the bodies touched, but the brains were torn out.

Buxton appends "a tracing from a photograph of one of the sheep that was still alive." The hole through which the brain has been removed is tiny, no more than an inch across.

> During the next ten days fifty-seven goats and sheep were destroyed in the same way; of these thirteen were found alive. The Lumbwa were all in a state of great terror, and weird stories were told of the 'Gadett': how it walked on its hind legs, pulled babies out of huts, and was even able to kill a man. Finally it was tracked to a ravine and killed by the Lumbwa with their spears. It turned out to be a very large hyæna of the ordinary spotted variety. It had evidently turned brain-eater through some sort of madness.

This anecdote can hardly be said to clear up the whole problem of the Nandi bear. The spotted hyena does not agree with the various descriptions of the unknown animal, nor is it completely proved that the beast the Lumbwa killed was the real culprit. This theory would imply that spotted hyenas are often seized with a strange "madness" which drives them to swallow the brains and spurn the rest of the body. Anyway, how do they set about trepanning the skulls so neatly?

But the most suspicious thing about the Nandi bear is not the way it

attacks, but that it attacks at all. Most so-called savage beasts never attack man unless they are wounded, startled or provoked. I therefore think it is a safe rule that the more nervous the animal the more dangerous it is. The large carnivores usually take no notice of man, whom they rightly distrust. If they do charge him deliberately it is in exceptional circumstances: usually when they have been starving for several days because they have been unable to obtain the game that is their usual diet. Hyatt Verrill observes:

> As a rule the man-eaters are old, decrepit tigers or lions which, being unable to bring down fleet footed, wary, wild animals, are forced to resort to killing easier prey and find human beings the easiest of any.

More general and serious famine affecting beasts of prey of all ages —and thus indirectly man who is liable to become their victim—may occur if disease or intensive hunting makes their normal prey scarce.

Famine may also be seasonal, particularly for the lion in the rainy season. In dry weather he cannot go for long without drinking and must always remain close to a water-hole where his prey must also come to drink. Thus he always has food to hand. But when the heavy rains begin, little puddles form here and there in the bush, and the herbivorous animals leave their usual dangerous drinking-holes. Now the lion must hunt for food; and if he is an old solitary male with no family ties he may wander very far afield. Bad luck in hunting may lead to long days with little food, and then he becomes a public menace, attacking the lonely traveller or leaping over stockades and killing cattle and even villagers in their huts. If his first attempts succeed, this way of life becomes a habit.

This happens but rarely, and serious naturalists are apt to be sceptical when an animal is said to be a man-eater. The Nandi bear's reputation in this respect is, however, based on unequivocal facts. A. Blayney Percival, the celebrated game-warden, is responsible for what is perhaps the only report of a *chemosit* being killed for its misdeeds: it happened in the Maraquet district not long before 1914.

> It is said that at one time one of these animals was so bad that great preparations were made to kill it, and at last it was killed by a party of men who put a dummy man in the doorway of a hut and sat inside and waited till the animal came and tried to take the dummy; it was then shot with arrows.

The following story is more circumstantial: in 1925 a village had suffered so much from one of these brute's depredations that the villagers asked the Government of Kenya for help. They said that it had

carried off a six-year-old girl one night after having cut a hole through the mud wall of her hut. What is more it had managed to force a way through a thorny hedge 8 feet thick and drag away some calves. Now the surprising thing about this is not that it should have carried off a person or a calf. A large beast of prey can carry a man or even a whole ox; in fact it is even capable, as many witnesses have affirmed, of leaping over a 6-foot palisade with such a burden in its mouth! The astonishing thing is the way the brute reached his victims. Lions and leopards never try to force a way through the thick and thorny fences round native cattle compounds because their noses and the pads on the feet are far too sensitive and vulnerable. They jump over the fence. A brute which could force its way through such a thicket of thorns must not only have strong burrowing claws but also an armour of thick hair and hide. Only a creature like a bear could perform such a feat.

The government official who was sent to investigate these raids has told the story in *Chambers's Journal* for 1927 in an article signed with the pseudonym "Fulahn," concealing the identity of Captain William Hichens of the Intelligence and Administrative Services of East Africa.

Although Chief Kitapmetit Kipet gave such a fantastic description of the *chimiset* which was supposed to be to blame, Hichens set to work as if he were after a real beast.

> Kipet informed me that the chimiset seemed to come from a small forest-clad kopje or boulder hill some five miles from his nganasa. I circled that kopje with spearsmen, and, gradually closing in, beat every bush and twig on it till we got to the summit. We put up baboons, rock-rabbits, some mongooses, some dik-dik antelopes, a bush-buck and its does; we put to flight owls, hawks, bats, and guinea-fowls. We found the lair of a porcupine family and a hyaena hole; we dug both out. We put up some wart-hogs, and the dogs turned out innumerable rats, mice, and lizards, and not a few scorpions and snakes. But we found no chimiset; nor trace of it. Nor did we find a trace of the spoor of lion or leopard, which might have been the culprits.
>
> I thought of a score of such hunts after the chimiset, all of which had proved futile, and decided to make quite sure. A huge forest, some twenty miles square, stretched away from the kopje. I could not search that forest, but I could make certain if any beast came to the kopje from the forest and then left the kopje by night for the village.
>
> Around the kopje ran several sandy bush-tracks, which led to water-holes. Cutting down the bush between, Kipet's men joined these paths until they made a sandy track completely encircling the kopje. We brushed this track clean and smooth, so that even a beetle walking over it would leave its trail.
>
> Then I went to bed. I had a small khaki-coloured pi-dog named

he mandrill may look as savage as a lion. A giant species might be the origin of the Nandi bear.

The spotted hyena has bee blamed for the Nandi bear crimes.

The ratel (*below*) which be comes quite black with ag has certainly been mistake for the Nandi bear at time Moreover it is a savage an aggressive beast.

Mbwambi with me, a mongrel, but a ferocious, plucky, little beast, and I tied him up to the door of my tent.

It was well after midnight when he gave a sharp, alarmed, whiny growl and woke me. But before I could get out of bed the whole tent rocked; the pole to which Mbwambi was tied flew out and let down the ridge-pole, enveloping me in flapping canvas. At the same moment the most awful howl I have ever heard split the night. The sheer demoniac horror of it froze me still, and not for some seconds did I hear the clatter of poles in Kipet's nganasa, which told of his men, having been aroused, unbarring their hut doors.

I heard my pi-dog yelp just once. There was a crashing of branches in the bush, and then thud, thud, thud of some huge beast making off. But that howl! I have heard half a dozen lions roaring in a stampede-chorus not twenty yards away; I have heard a maddened cow-elephant trumpeting; I have heard a trapped leopard make the silent night miles a rocking agony with screaming, snarling roars. But never have I heard, nor do I wish to hear again, such a howl as that of the chimiset.

A trail of red spots on the sand showed where my pi-dog had gone. Beside that trail were huge footprints, four times as big as a man's, showing the imprint of three huge clawed toes, with trefoil marks like a lion's pad where the sole of the foot pressed down. But no lion, not even the giant 9 feet 4½ inches long which fell to Getekonot, my hunter, at Ussure, ever boasted such a paw as that of the monster which had made that terrifying spoor.

At the first streak of dawn we followed those tracks; they led to the kopje. Over our sandy path they showed as plain as the print on this page; on the farther side of the kopje were more footprints leading to the forest, where, searching with our hearts in our mouths every day for a week and more, we found and lost and lost and found them. But we found no chimiset.

This "terrifying spoor" is not at all like that found beside the Magadi railway, which was undoubtedly that of a plantigrade animal like a bear or an ape. Captain Hichens's imprints seem to be those of a digitigrade

95. Lion's footprint (one-quarter size).

96. Spotted hyena's footprint (one-quarter size).

animal like a cat, or rather a hyena, since its claws were not retracted. Obviously these must be due to two different animals. Roger Courtney in *Africa Calling* describes some footprints of an alleged Nandi bear which are more like those of Hichens's *chimiset*:

> One day, when hunting in the forest, I was shown by a palpitating game-scout a pair of very peculiar animal footmarks. They were two enormous pug marks, the size of dinner-plates, in a soft patch of ground. They were spade-shaped and turned inward. The claws must have been non-retractile, as I could distinctly see the small cuts where they had dug into the earth. The fact that they turned inward revealed a bear-like character; otherwise I would have said that they had been made by the grandfather of all hyenas.
>
> But, then, a hyena enormous enough to leave footprints as big as those would have himself been a fabulous beast.

There have been rumours that the Nandi bear has six toes on each foot—which have helped to discredit it in zoologists' eyes. This absurd story is based on imprints with six toe-pads and six claws. In *Nature Parade* Frank Lane has published a sketch of one of them, found in the sand "in dry-season river-bed of Dalumo River, Iyambi." It is obviously a composite print made by an animal which normally puts its hind-feet down on the imprints of its fore-feet.

On one point everyone who has examined a supposed *chemosit*'s track is agreed: it cannot be a feline animal with retractile claws.

From all over East Africa and for almost half a century generally consistent rumours about the beast have come, and still regularly come. It may even be responsible for the depredations of an unknown animal in much of north Cape Province and the Transvaal in the thirties. Captain William Hichens writes in 1937, this time signing his own name:

> No one has seen the animal, but its spoor is known and its savage depredations have caused widespread alarm. The natives call it the *khodumodumo*, or "gaping-mouthed-bush-monster." In stealthy silence, under cover of the darkest nights, this marauder invades the kraals and farms, clambers over six-foot palisades which pole in the cattle-byres and stock-pens and then, seizing a sheep, goat, or calf, leaps back over the fence, to disappear with its quarry.
>
> Its spoor on the kraal pathways and bushveld tracks only serves to shroud the animal in deeper mystery. Its footprints are "round, saucer-like spoor, with two-inch toenail marks," a pug which has so far puzzled hunters to identify, since it does not fit the paw of any known wild beast that raids stock. The *khodumodumo*'s attacks were especially

predatory in the Graaffreinet area, where a posse of over a hundred settlers turned out to hunt the beast down, a large reward having been placed on its head.

While this may give an indication of the Nandi bear's area of distribution, it tells us little about its possible identity. Major Braithwaite and C. Kenneth Archer, two experienced British settlers in Kenya, are more helpful in this respect. They were lucky enough to be able to watch what they thought was a Nandi bear in the tall grass and shrub of the savannah. At first they took it for a lioness, but when they saw its profile they got the impression it had a snout. Its head was very large. At the withers, which were very high, it was about 4 feet 6 inches high.

> The back sloped steeply to the hindquarters, and the animal moved with a shambling gait which can best be compared with the shuffle of a bear. The coat was thick and dark brown in colour. . . . Finally the beast broke into a shambling trot and made for a belt of trees near the river, where it was lost.

Reports were so common during this century that C. R. S. Pitman could write:

> Not long ago there was scarcely a white man in those districts who had not at one time or another either actually seen the beast or had some experience connected with it.

Among the naturalists, game-wardens and hunters, many of whom stated their belief that the Nandi bear existed—whatever its precise zoological identity might be—were F. C. Selous, a distinguished naturalist and one of the greatest experts on African fauna, A. Blayney Percival, late of the Kenya Game Department, and Captain William Hichens, who quotes a Uganda game-warden as saying "I believe in the Nandi bear; it may be a giant hyaena; it may be something different from anything we know," and himself adds, "Some fearsome monster, named *kerit*, lurks in the forests of East Africa and yet awaits capture and identification."

The Nandi bear has even appeared in official publications. The *Report of the Game Department of the Colony and Protectorate of Kenya* for 1932–1934 contains several accounts gathered by the Chief Game-Warden Captain A. T. A. Ritchie about "our old friend the Nandi bear." The first comes from Captain F. D. Hislop, District Commissioner of Kapsabet, and describes a beast which certainly sounds like a bear.

> I have to announce that we believe we saw a Nandi bear! Naturally, I cannot be positive. Just at dusk, we were about half a mile short of

the point where the Londiani and Eldama Ravine roads fork. Suddenly, loping along the right-hand side of the road which is bordered by forest, we saw a dark grey creature, about three feet high to the back, round and even podgy, with a small pointed head. It moved on all four legs, but with a slight pronounced power in the hind legs. It went on for about fifty yards until it found an opening into the forest and disappeared.

I am unable to say what it was if not a bear. It was not a hyena or a baboon—of that I am certain. I have never seen any other animal like this. Its whole appearance and action was like a bear, and obviously not afraid of the car, as it moved quite sedately until it found a chance to cut into the forest. I really think it must have been the legendary animal, but of course I cannot assert this as a fact.

The second account comes from Gunnar Anderssen at Kaimosi on the Zinga Estate and seems to refer to the same animal. One rainy day he heard his boys shouting:

When I came to see what was wrong I found them still shouting, a few hundred yards from my house, round a killed forest pig. At the same time I heard a roar from the forest—not like anything I have ever heard before. That the pig had been killed by a very powerful animal could easily be seen, and to judge from the roar he was not very pleased to be driven off.

I asked the boys to help me to track, but they refused absolutely, explaining that they would not have anything to do with the "Sheitani" as it was translated to me from Nandi language. It was no use me going alone into the forest, so when the boys had cooled down a bit, I took their description of the beast, without making any suggestions to them:

"Very big, with long black hair and a long tail."

"With long black hair, the tail carried like a dog's, the head not very big, but *baya sana*."

Very big and powerful it must have been from the way the pig had been handled. As regards black hair, we found long black hair lost in the battle, soft hair: this was not from the pig, which had coarser hair. The boys could not explain in what way the head was *baya sana*, but they all agreed that it was very bad.

I could not get a clear foot-mark in the grass. What I could see looked very large, something like the mark of an old leopard which could not draw in his claws properly. The pig appeared to have been killed in an extraordinary way, as if it had been hit with, say, a log, breaking the backbone; it had then been turned over and the stomach, heart, etc., had been eaten.

I suggested to the boys that it must have been a hyena with longer front legs than hind legs, but they said no. They knew about the very big forest hyena, but that hyena was not black, more the colour of my washed-out corduroys. No: this was the "devil" and they would not

have anything to do with it. However, they got the pig, and they did not seem to mind who or what had killed it

As rain started again, I could not follow the tracks to get the footmarks on softer ground. This story may sound a bit funny—I think so myself—but so it happened.

Finally, to complete the record, I shall add the strange encounter which Charles T. Stoneham tells in his book *Hunting Wild Beasts with Rifle and Camera* (1933). He had set up a trading-station at Sotik on the edge of the Lumbwa Reserve.

My bedroom was a little round hut, some distance removed from the others. Beside it grew a patch of evergreen bush, behind it the grass sloped away to a valley wherein a narrow stream gurgled along the declivities to join the Kipsanoi river, half a mile below.

One night, thinking I heard a noise, I sneaked quickly from my hut and stood against the wall of it, shaded by the thatched eaves. . . . Mist hung over the feathery grasses, pale silver and quiet; there was not a breath of wind. I saw some beast travelling towards me through the mist, and I could not think what creature it could be. It was the size of a lion, but its movements were unlike Simba's slouching stride. The grass came up to its belly, its head was held low before its bulk, it appeared to have an enormous tail. Slowly and quietly it approached, and I waited, intensely interested, knowing it could neither smell nor see me. The moon passed behind a cloud; the animal became indistinct in the mist. When within a dozen paces it stopped, and at that moment the moon shone out again clear and brilliant.

I received a dreadful shock. The beast was like nothing I had ever seen or imagined. It had a huge square head, and the snout of a pig; its eyes, two black spots, were fixed upon me in an observant stare. Large circular ears, the size of plates, stood up from its head, and they were transparent—I could see the grass through them. The creature's body was covered with coarse brown hair, its tail was the size of a tree trunk.

There is an ant-eater in Kenya, a survival of the age when the cave bear and the woolly rhinoceros roamed the earth, but this beast, though like to that rare species, was not of it.

Stoneham ran indoors to fetch his rifle, but when he came back he saw the beast's hindquarters disappearing into the mist. He did not fire for fear of merely wounding it and making it dangerous.

When he told his friends about his adventure the next day they all were inclined to think he had seen the Nandi bear.

But I am inclined to think I saw some weird, hybrid ant-eater, and am sorry I had not the pluck to go after it and find out all about it.

That is the chief evidence for the Nandi bear. Now for the experts' opinions. Blayney Percival writes:

> The stories vary to a very large extent, but the following points seem to agree. The animal is of fairly large size, it stands on its hind legs at times, is nocturnal, very fierce, kills man or animals.

C. R. S. Pitman, who does not believe that the Nandi bear is an unknown species, has underlined the contradictions in the numerous reports he had collected personally:

> By day, a dark rufous or tawny-hued creature resembling either bear or gigantic ape, almost invariably viewed indistinctly at a distance and usually in longish grass; and by night a long-haired brute having the appearance of a bear, abnormal hyena or South American giant ant-eater.

And indeed the beast would have to be Proteus himself in order to look like all the animals it has been said to resemble: a gorilla, an ant-eater, a hyena and a bear, and to be black, tawny, red and grey in colour, sometimes tailless and sometimes with a brush, sometimes earless and sometimes with distinct ears.

The most obvious conclusion is that it is an animal belonging to one of the types just mentioned, and that all these puzzling divergences are due to people observing other animals which have nothing to do with the question. Let us begin with C. R. S. Pitman's list and proceed by elimination. We can discard the giant anteater at once, for it is a spe-

97. The aardvark.

cifically South American animal, belonging to a group found only in America. I feel sure that the animal actually referred to by this term is the aardvark, an African burrowing anteating animal whose Latin name is *Orycteropus* and whose English one is the Afrikaans for "earth-pig." This animal is very rarely seen, since it spends the day in burrows under the earth and prowls only at night. It has a pig's snout and huge ears. Its skin is usually almost bare with only scattered bristles, though sometimes it is hairier, especially on the lower part of the body (this is a distinctive characteristic of the South African species, *Orycteropus capensis*, compared with the Central African and Abyssinian, *O. aethiopicus*), and then its coarse yellowish-brown to russet hair does remind one a little of a bear's. It has a powerful tail, upon which it can lean like a kangaroo, and often stands on its hind-legs: a second bear-like feature. And it is often known as an ant-bear. Could the Nandi bear be an aardvark?

Certainly it is so rare to see one that people might easily be bewildered by meeting an aardvark. Personally I am almost certain that it was an ordinary aardvark that Charles Stoneham saw, whatever he may think. No doubt he had seen this beast only in drawings and photographs, and in the moonlight and mist it seemed to him even more extraordinary than it really is. His description is so full of features that betray the animal's identity—the pig's snout, round ears that sometimes hang down on the side of the head and have skin so thin as to be translucent, the brown fur, the tail as long as a tree-trunk—that there can be hardly any doubt. We can therefore dismiss this report.

It is also possible that the aardvark's footprints may have sometimes been attributed to the Nandi bear by puzzled witnesses; for when it stands up on its hind-legs it may put a large part of the sole of its foot on the ground and leave the marks of five toes with stout claws: which are actually little pointed hooves with which it digs in the earth.

Though this elusive and infernal creature (for the infernal regions are always underground) is treated with superstitious fear by the Watussi of Ruanda, there is no justification for their fear. The aardvark cannot be blamed for any bloody depredations; it eats ants and termites, and has nothing to gain by slaughtering cattle or human beings. It does not look in the least like most of the descriptions of the Nandi bear. Williams and Hickes both stress the small ears and inconspicuous tail; and the aardvark has the thickest tail and most conspicuous ears of any of the larger mammals. Corbett is the only witness besides Stoneham to

describe large ears, but he says the animal he saw was not heavily built and rather long from hock to foot.

Anderssen's boys spoke of a long tail, and the "long hair behind" on Major Toulson's beast also suggests a tail, but both these beasts were quite black. The mane and large canines of the *koddoelo* and the little pointed head of Captain Hislop's animal do not agree with an aardvark, which has one habit that nobody has attributed to the Nandi bear. When it is alarmed it starts digging for all it is worth, sending clouds of dust flying. Our mysterious beasts have always made off at top speed.

So the Nandi bear is not an aardvark.

It might seem self-evident that the Nandi bear is a bear. Most witnesses compare the *chemosit* to one, and the Wa-Swahili give it the Arab name of *duba*. The zoogeographical argument that bears are conspicuously absent all over Africa is not conclusive, since they are found in the mountains of Spanish Morocco—or were found there until lately. If they could reach Africa from Europe before the Straits of Gibraltar were formed, why could they not continue their journey to Central and East Africa?

This argument is sound enough, but most of the accounts do not agree with a bear. Many of them mention a clearly visible tail, and the others never speak of a stump of a tail, so characteristic of the bear, but say that it was indistinct or not visible, implying that it could well have been tucked between the legs. There are also descriptions of a slender beast, and of one with short legs. And what are we to make of those that insist that it has a mane and smoother, less hairy, hindquarters? All the bears, whether long- or short-haired, are remarkably evenly covered with fur. Moreover, when in a hurry, but not actually galloping, they adopt a gait which is so characteristic that it is not easily overlooked. Now although some witnesses have said that it had "a gait similar to that of a bear—a kind of shuffling walk" or "a shambling gait which can best be compared with the shuffle of a bear," no one has actually said that it *ambled*, that is to say that it ran by simultaneously moving both legs on one side of the body. This is most important, since no ape runs in this way, and the only carnivores to do so are the bear, the hyena and the South American maned wolf. That a heavily-built animal should shuffle or shamble is quite natural, but so would a gorilla, a bear, an old lion or a wild pig. At one moment I thought I had found an exception when I read in Geoffrey Williams's account, quoted in an American magazine, that the beast "ambled away." But on checking with the

original text I found that he had actually written "shambled away." It is always best to check one's references.

The only witness who has described the beast's gait in detail is Hickes, who followed it for a good while along the Magadi railway. He says it "loped off—running with its fore-legs and with both hind legs rising at the same time." This is none too clearly put, but it does imply that when the beast trots or gallops its two hind-feet always leave the ground together, while its fore-feet do not move together. This irregular gait in which the fore-legs touch the ground in turn, while the hindquarters move as a single unit, is like the so-called "pithecoid" gallop so characteristic of monkeys in a hurry. The fore-feet always move forward at a slight angle. Williams's cousin's phrase "a sort of sideways canter" is a good description.

This brings us to the next theory: is the Nandi bear an ape? The negroes of the Mau and Nandi country usually think of the *chemosit* or *kerit* as a sort of giant ape, and the Wa-Pokomo describe the *koddoelo* as an enormous baboon. The beast that the Nandi villagers killed because it had climbed on the roof of a hut could hardly have been a lion or a hyena. It sounds more like an ape. Even the white men's descriptions often suggest an ape. "In most stories," Blayney Percival points out, "the resemblance to a monkey of sorts is very noticeable, but the fact that the animal is nocturnal, a point on which all native accounts agree, at once makes this impossible."

This *a priori* argument is not really tenable. Primates as a whole show a clear tendency towards a nocturnal life, natural enough for such generally defenceless animals. The tarsiers and most lemurs have chosen this life and are partly adapted for it. Among the true monkeys, there are several species with nocturnal habits, especially in America. The douroucouli (*Aotes*) is purely nocturnal. The howlers belong more to dawn and dusk. And many of the American monkeys may be fond of excursions at night. I have a little capuchin monkey from Brazil, which when I am in the south of France enjoys complete freedom and can if he wishes go and play in the bushes around my bungalow. Very often he goes out on moonless nights, and although it is far too dark for me to see him, I can hear him jumping about among the leaves with perfect confidence. He is usually timid, but at night he is not only not afraid of the dark, but actually seems to enjoy it, and even to be able to see clearly.

It would not be so extraordinary if an African ape were to have

nocturnal habits.[1] This may even be the reason why it is unknown to science.

Hichens writes about this theory:

> Some of us who have hunted the brute share the view that it may be an anthropoid. Its raids invariably occur on the skirts of forest land, which might be the haunt of one of the great apes. To those who would object that the apes are not man-killing carnivores, the answer is that one is not so sure; the chacma baboon is a desperate "carnivore" and is a serious menace to sheep-farmers in South Africa, where the baboon-packs raid the flocks, ripping up lambs with their long-clawed thumbs and lion-like fangs and carrying off the carcases to their kopje haunts.

It is quite true that most people, even naturalists, have a mistaken idea of monkeys' and apes' diet. A few are strict vegetarians; most are omnivorous, and prey on such small creatures as insects, lizards, small birds and rodents. But this is not always so. South American farmers find capuchin monkeys as troublesome as foxes; if they manage to get into a chicken-run they slaughter all the poultry, even if they carry off only a few scraps of the meat. When my own little monkey was only three months old and spent his days clinging to his mother's back, he had already started to slip out between his bars at night and kill pullets, which he always brought back to his mother in her cage. Unless one has seen a troop of marmosets ravenously tearing up a bird's carcase it is hard to realise quite how savage these attractive little devils may be.

Despite many assertions to the contrary, the gorilla has been proved to be partly carnivorous. Colonel C. R. S. Pitman saw one catch a mouse and skin it neatly before eating it. He says that the gorilla sometimes eats birds and rodents and even small antelopes. Cestoda, the group of parasitic worms to which the tapeworms belong and which are peculiar to meat-eaters, have often been found in gorillas' intestines.[2]

All the same, a large and bloodthirsty anthropoid ape is a rather absurd notion. The gorilla, despite its enormous strength, is essentially a peaceful and timid creature, and prudent enough to avoid man and his

[1] "Although it is unusual for any of the larger primates to move about after dark, I once came across a large troop of baboons about half-past eight in the evening moving in file through long, wet grass. If it had been a belated troop returning from feeding grounds in the savanna this unusual behaviour would have been explicable. But as, on the contrary, the troop was moving *away* from its customary night quarters in the dense cover fringing a river, I am at a loss to offer a satisfactory explanation."—Colonel C. R. S. Pitman.

[2] In captivity the gorilla is apt to eat its own dung, often with fatal results. This tendency to coprophagy may well be due merely to the lack of meat in its prescribed diet.

deadly weapons. The French explorer Albert Mahuzier has well observed: "It is very difficult to make contact, since man is very afraid of gorillas, and gorillas are very afraid of man."

It is true that in 1920 at Kayonsa an unprovoked gorilla killed a native. But one cannot be sure that the native did not provoke the gorilla unawares by approaching a thicket or a tree in which a baby gorilla lay hidden; and the gorilla may well be vindictive. It is a shy beast, less amenable in captivity than the chimpanzee, but decidedly more intelligent. It might very well revenge itself on men who had killed its mate or its young. But there is no doubt that gorillas are not in the habit of attacking men, still less of raiding villages and carrying off cattle. Indeed such behaviour is quite inconceivable.

One cannot say the same of the Cynocephala or dog-headed monkeys, like the South African chacma, the Abyssinian gelada or the mandrill of the equatorial forests. As Captain Hichens has pointed out, they often attack lambs and disembowel them. They are often even accused of carrying off children and assaulting women. Reliable nineteenth-century observers thought these accusations were well-founded. Brehm writes that Schimper had assured him that

> The hamadryad readily attacks man and even succeeds in killing him; two old males without the least provocation assaulted some girls gathering wood and killed them when they resisted. Rüppel for his part considers this hideous monkey among man's most dangerous enemies.

Colonel Pitman writes of baboons:

> One year, in a part of the Bunyoro District, five native children were attacked and severely bitten within a few days of each other: two of them died. . . . Children, while protecting crops, are sometimes killed. The ape's method of attack is to seize the little watchman in its arms and then virtually disembowel him with terrible, downward strokes of its muscular feet.

E. G. Boulenger adds:

> So utterly without regard are baboons for native women that in some remote parts of Natal washing clothes or filling water-vessels can be done only under cover of an armed guard.

I do not think that baboons attack women from mere lack of "regard," but from sheer lust. Certainly apes are sexually stimulated by the sight of women. I have several times seen a young tame baboon, whose master had brought it to the Mediterranean coast, assault women who were sunbathing and attempt to abuse them. And it was hardly a

98. Reconstruction of a giant baboon.

year old and had not reached the age of puberty! When this happens in nature, and the monkey is an adult male almost as big as man and almost mad when in rut, there could obviously be a bloody scene if the victim tried to resist. A large baboon's teeth are quite as formidable as a hyena's or a leopard's. It is hardly surprising that even the larger beasts of prey avoid these quarrelsome and brutal apes and that natives refuse to venture in the forests where they dwell. Does the so-called "Nandi bear" agree with the description of any kind of baboon? The *koddoelo* certainly does, since the Wa-Pokomo themselves compare it to one. The long hair on the back and neck where it forms a mane, thicker fore-legs, long snout, long canine teeth, four powerful claws, short and thick tail: the picture is complete. Even the baboon's gait is described exactly: it can occasionally stand on its hind-legs but it very seldom climbs trees.

What about the beast of the uplands, seen on the Uasin Gishu plateau and at Magadi, and called *chemosit* or *kerit* by the natives? If

we compare the three best European accounts, Williams's, Hickes's and that of Major Braithwaite and Kenneth Archer, we find they agree perfectly in the following particulars: [1]

1. Thick stocky body.
2. High withers, sloping back.
3. Forequarters covered with thick fur, hindquarters smoother and barer.
4. Long rather pointed snout.
5. Small ears.
6. No visible tail (the mandrill and the drill have tails no longer than a bear's).
7. Colour tawny (like a lion or hyena) to dark brown.

These significant features are completed by several details given by Hickes, who stresses that it was broad across the rump, had a short neck and "stumpy" nose, and that the legs were shaggy right down to the feet which seemed large.

One could hardly wish for a better "pen-portrait" of one of the Cynocephala, the dog-headed monkeys which include the gelada, drill and mandrill as well as the baboons proper. One wonders why Williams insisted that it was not the least like a baboon. Presumably he had the ordinary green baboon in mind, and perhaps the beast's size was the reason, for he reckoned that it was almost 5 feet high when sitting up. Hickes thought it was the size of lion which may reach 3 feet at the withers. Braithwaite and Archer put its height at the withers at 4 feet 6 inches—the height of a deer. The Wa-Pokomo said that their *kod-doelo* was about 6 feet long and 3 feet 6 inches high.

The largest known baboon, the gelada (*Theropithecus gelada*), is nowhere near this size, being no more than 3 feet high whether sitting up or on all fours. But Schimper affirms that "old males may reach the height of a man" and Colonel Pitman writes:

> Several years ago I was informed that an outsize race of baboons frequented certain parts of the [Mabira] forest. They occurred either singly or in small parties, were reputed to be nearly the size of a full-grown man, extremely wary and rarely seen. Further, it was stated that the attitude of these nasty creatures towards unarmed natives was extremely truculent and, naturally the local folk were very afraid of them.

[1] I am shelving for the moment reports like Major Toulson's, Captain Hislop's and that of Anderssen's boys, which all refer to a clearly different animal, all black and with short legs, to say nothing of Corbett's beast which is different again.

I was promised a specimen if one could be obtained. Eventually an enormous example was collected, but though interesting it proved to be nothing new, the scientific verdict given at the British Museum (Natural History) identifying it with *Papio anubis anubis*—the green baboon.

Alas, he does not say exactly how "enormous" it was. So, referring only to known baboons, we can say that the Nandi bear is between one-and-a-half and two times the size of an ordinary baboon and a third larger than the giants in the group. It was natural enough for the witnesses to compare so large a beast to a bear, with which, I think, a large baboon could easily be confused. Topfel thought that the mandrill was the *Arctocyon* or dog-bear of the ancients who believed it was a cross between the two animals.

Now, while there are no known baboons as large as the "Nandi bear" —though the last to be discovered, the gelada, is the biggest—they existed in the past. Palaeontological discoveries have established that in India there was once a sort of giant baboon, the *Simopithecus*, which was twice as high as the present baboons. Moreover Dr Broom has found remains of giant baboons in Africa itself; and he has given them the scientific name of *Dinopithecus*. May not their descendants have given rise to the widespread legends about the *chemosit* and *koddoelo*? At all events a reconstruction of a giant baboon is extraordinarily like most of the natives' and many of the settlers' descriptions of them. And if such a beast survived it is easy to see why the *chemosit* arouses such terror. The mere thought that there may be a living animal as huge and strong as a gorilla and as brutally savage as a baboon is frightening enough.

This theory, which I do not think anyone has put forward before, is too daring for the sceptical zoologists who prefer the more commonplace explanation of a giant hyena, a familiar animal in Africa. This was the view of R. I. Pocock, Superintendent of the London Zoo. He has maintained that the Nandi bear is merely the common spotted hyena (*Crocuta crocuta*), which has a head and general outline strikingly like a bear's and which moreover ambles like a bear. It is also savage enough to be the monster.

The spotted hyena is very cowardly, and often shrinks from attacking herds for fear of their hooves. It usually makes do with carrion. But carrion is often short where the vultures are always the first on the scene. Then the starving hyena creeps into the native huts to seize someone asleep. The children are usually put to sleep in the passage at the en-

trance to the hut, and thus become the hyena's prey. Natives often bear the scars of horrible mutilation on their faces, a sign that they were attacked as children. Like all timid beasts, the hyena is sometimes incredibly audacious. Several reliable witnesses have told me that they have seen hyenas attack people in broad daylight when they were resting a little way from their party. One day the Mwami of Ruanda's sister was travelling in a jeep, the journey was so jolting and hot that she had to get out into the bush to be sick. Suddenly a huge hyena burst out of a thicket and attacked her. Luckily there were some crack shots in her escort and the hyena was stopped dead.

Colonel Pitman has also pointed out that the spotted hyena seems to grow fiercer with age:

> Some of the older animals not infrequently become abnormally large. Development in size seems to be coincident with increased ferocity. Tales of "man-killing" usually refer to "giant" hyenas. For instance, a giant hyena dragged an old woman from a hut in Karamoja, and devoured her. In the same district another giant marauder killed and ate a seven-year-old boy, who was sleeping out in the thorn scrub.

The Nandi bear's fur is sometimes described as black, sometimes as reddish. Pocock has pointed out that the spotted hyena varies greatly in colour in the course of its growth; and just as there are white mutations (albinism) in many mammals, that is to say abnormally coloured offspring of normal parents, and black mutations (melanism) of the panther, so there are red mutations (erythrism) of the spotted hyena, which Pocock suggests may be the origin of the legend of the Nandi bear. These mutations are commoner in the north (Somaliland and Sudan) than in East Africa, where they might be taken for unknown monsters. Pocock therefore thinks that the red hyena is "the Chemosit, Kateit, and Gereit of the Mau Escarpment and the Nandi country; the Sabrookoo of the Bagishu and Sabai of Mt. Elgon; the Engargiya of Buganda and parts of Bunyoro; the Entarargo [1] of the Kigezi and Ankole," and so on. He backs up his argument with a skin sent him from Nyasaland by a man who thought it came from a Nandi bear. Actually it belonged to

[1] The *entarago*—or *ntarago*—is quite a different animal from the Nandi bear. Temple-Perkins (see page 369) has shown that it is an unknown animal of the cat tribe. Pocock's error arises from a mistake of Colonel Pitman who thought the *ntarago* was a "mysterious hyena-like animal" and that it was responsible for a freak skull of a hyena shot at Katunguru by Temple-Perkins and for a hyena's skin and leopard's skull which some Kigezi pretended belonged to the local monster. This seems to be a very common form of joke in Africa.

an unusually red spotted hyena, and the skull sent with it was that of an unusually large leopard.

I do not think this skin clinches Pocock's argument. If he had received only the skin one could conclude that some people at least thought that the red hyena was an extraordinary creature worthy of the name "Nandi bear." But as it is, all we can say is that Pocock's correspondent was either the victim or the author of a hoax. Besides, Nyasaland is too far from the scene of the Nandi bear's crimes for it to be responsible for the skin.

There have been similar hoaxes about most unknown animals. They are more often the work of some wag trying to confuse the issue than of a forger trying to make money. Sometimes they even come from a convinced believer, who, for lack of proof of his sincerity, fabricates false ones, thus discrediting the well-founded legend he was trying to prove.

Charles Stoneham tells a story which is much better evidence for the hyena theory:

> In 1930 a man brought me a skull like a hyena's skull, but of larger size. He had a farm at Koru, where at about that time cattle and sheep had been killed by some mysterious agency. The Lumbwa herdsmen ascribed these deaths to the chemoiset. The farmer had set numerous traps, and one day, on returning from a week's holiday, his boys informed him that the marauder had been caught. It was a young chemoiset, they said. Being unwilling to lay hands on the beast's body they had tied a rope to it and towed it away into the bush. There the farmer found all that remained of the body, and he brought the skull to me.
>
> I am no zoologist, so I turned the skull over to the Game Department, with a request for their opinion. They pronounced it to be the skull of a hyena. A few days later Mr. Leakey dropped in; without comment I showed him the skull. He was puzzled and interested. According to him the teeth were not those of either the striped or the spotted hyena; he wanted the brains and hair of the beast to send to the British Museum.
>
> A short while later he wrote to say that the skull was that of a solitary brown hyena, a species observed in Rhodesia, but never before seen in Kenya. I communicated with the farmer, and managed to procure some scraps of hair and a few bones, which were sent off for classification. After a lapse of months I heard from Mr. Leakey that he had found other specimens of the same beast, and did not think it much of a rarity. So once again the trail of the Nandi bear led to an impasse.

The brown hyena (*Hyaena brunnea*) was described in 1820 by the explorer and zoologist Carl Peter Thünberg. It is closely related to the striped hyena (*Hyaena hyaena*), and is the same size—smaller than the

spotted hyena (*Crocuta crocuta*). It can be recognised by its uniform dark-brown colour, marked only with a few whitish spots on the legs, and by the length of its shaggy fur, which forms a lighter mane on its shoulders and falls like a coat on its sides. It is the one hyena massive enough to remind one of a bear. But its plume of a tail and its particularly long and upstanding ears make it difficult for one to see how there could be any confusion.

The brown hyena lives chiefly in South Africa, where it roams at night on the edges of streams or on beaches. For this reason the Afrikaaners call it "strand wolf." It feeds mainly on crabs and dead fish, but sometimes attacks young cattle.

The brown hyena is not usually supposed to be found north of the Zambezi, but its area of distribution seems once to have reached as far as Kilimanjaro. Thus it is not impossible that there may still be very rare specimens in Tanganyika and even in Kenya. Naturally the unusual appearance of one of these dark-maned hyenas would be most disconcerting and liable to produce plenty of fantastic interpretations. And Stoneham's story shows that even the natives could mistake a brown hyena for a young *chemosit*.

Pocock's skin and Stoneham's relics made the Nandi bear a laughing-stock for a while, and much bitter controversy flew back and forth between sceptics' armchairs in London and embattled witnesses in Africa, for whom Captain Hichens speaks as follows:

> As to the oft-repeated suggestion that the beast accounted for by Africans as a Nandi bear is really no more than a hyena, I have never been impressed by that explanation which seems to me to be an evasion rather than an explanation. Hyenas are as common around most African villages as rabbits around English villages; their habits, appearance and spoor are thoroughly well known to every villager and to suggest that, not once, but dozens of times in many places, kraalsmen would mistake a hyena for a Nandi bear is on a par with suggesting that countryfolk all over England could mistake a rabbit for, say, a fox.

It is quite clear from almost all the descriptions that the beast cannot be a hyena, unless it is some strange crossbreed with a spotted hyena's round ears and an even shorter tail, combined with the brown hyena's thick dark fur. The hyena is a digitigrade animal and would find it as hard to stand up on its hind-legs as a dog or a cat. And a hyena that stood 4 feet 6 inches at the withers would be an unknown animal as remarkable as a giant baboon.

Moreover, as Captain Hichens has pointed out, the *khodumodumo*'s

method of stealing cattle in the Transvaal would be impossible for a hyena, which drags its victims. It is as incapable of leaping over a 6-foot fence with a calf in its mouth as it is of forcing its way through a wall of thorns. Besides, the hyena is a noisy brute: it wails before killing its victim and gives piercing cries immediately afterwards.

So the Nandi bear is not an aardvark, bear, known ape or ordinary hyena. We have been multiplying possibilities without simplifying the problem. And indeed it is the very quantity of evidence that makes it so complex, as Blayney Percival implies when he writes in *A Game Ranger's Notebook* (1924):

> For many years now I have been trying to discover upon what foundation rests the native report of an animal called the "chimiset," said to inhabit the Nandi forests. The more I hear, the more difficult it becomes to reconcile this creature with any known species. . . . Time will show, no doubt; meantime I do no more than state my belief that there is an animal of arboreal and nocturnal habit in the Nandi forests awaiting discovery, description and Latin name.

Earlier, in 1914, when the Nandi bear was much talked of in Kenya, he had been more sceptical about its existence and positive with his explanations:

> Personally, I am quite in the dark about the beast, and am still a bit doubtful about its existence as a new animal.
>
> During my many years in Africa I have investigated so many stories of this sort and in the end found that the real thing was something that would have been easy to identify if it had been seen by a naturalist who would have noted the more valuable points by which one could have easily got an idea of what it was. . . .
>
> My own view of the *chimiset* is that it consists of a number of animals.
>
> The chimpanzee as a base, ratel, leopard, lion, baboon, bush pig, and hunting dog; amongst the natives the stories are, I think, half legendary and are kept alive by any cases of persons or cattle being killed in any out-of-the-way manner. Amongst white men on the Plateau or in the Nandi district any animal that cannot be recognised is apt to be put down at once to the 'undescribed' animal.

But he adds:

> The strongest point in favour of there being such an animal is that it has a native name, and appears to be well known amongst the Nandi.

Certainly his attempt to divide up the settlers' accounts into different animals seems sound enough when we compare the various descriptions of the time. Major Toulson's and Corbett's animals are obviously not

the same as Hickes's. The same animal could not leave plantigrade footprints in one place and digitigrade ones in another. There must be several quite different animals. Blayney Percival remarks:

> I look upon the reports from the Nandi and from Magadi as referring to totally different animals, and they should not be considered together.

Now he was certainly right in considering the Nandi bear as a composite of several animals. What made him alter his opinion to a declaration of ignorance? The fact that many of the descriptions applied to an unknown animal, and that other known animals had crept in to blur the picture. Let us see what these known animals are.

Here I am glad to be able to offer a very pertinent description of what at first seems to be an unknown animal given me by Georges Sandrart, who did some ethnological research in the Belgian Congo when he was the Resident in Ruanda-Urundi.

> In 1936 I was on an excursion on the ridge of the Congo–Nile watershed, at an altitude varying between 8,000 and 11,500 feet, where some of the last patches of virgin forest still survive. One day in broad daylight about noon I saw a little bear, slightly smaller than a Carpathian bear, round a bend in the path. I was astounded, so I took great care to examine it minutely. Its fur was shining blackish brown and I could see a triangle of silver hairs on the peak of its forehead. The apparent absence of tail, the shape of the head, the large snout, the little round ears, the slope of the back, the relatively long legs, *everything about the animal reminded me of a bear*. But a bear in Africa. . . .

He wasn't dreaming. The late Chief Semu Geshi, who happened to be with him, confirmed every detail of his description. Another European had seen the animal; and two pygmies had seen one attack a forest-antelope and furiously try to bite its leg. They called it *isata*, or "honey-eater," and even produced a skin. It turned out to be an animal that is rarely met, because it is both nocturnal and burrowing, but which is well known to zoologists: the honey-badger or ratel (*Mellivora ratel*), which G. S. Cansdale says is probably seen less often than any other small carnivore. All the same it is found all over Africa as well as in Arabia and India.

The ratel is not strictly speaking a bear, even though it has a similar head, general shape of the body, thick coarse hair and powerful claws, and, thanks to its almost plantigrade feet, also tends to stand up on its hind-legs. It belongs to the closely related family of Mustelidae and is a sort of plump badger, all black except for the top of the head and the

99. When the ratel turns black with age it is very like a bear.

back, which are covered with a clearly defined band of silver hair. As both its Latin and its pygmy name imply, it is reputed to eat honey.

Was this then what so many people took for a bear? There is no doubt it is what Sandrart saw (the triangle of silver hair on the forehead is very significant), but even so he is convinced that it was a giant species, still unknown to science.

I must admit that for a long time I believed that the ratel was a small creature, not so big as a European badger, but Sandrart's account set me researching, and I was astonished to find that some ratel skins from Central Africa are as much as 3 feet 6 inches from the nose to the tip of the tail (which is quite small and no more than 8 inches long). It is almost as big as the smallest of the bears, the Malayan sun-bear.

But if some of the Nandi bears were ratels, why had nobody mentioned the conspicuous band of white down the head and back? This puzzled me for some time, until I discovered that in 1906 Lydekker had described, under the name of *Mellivora cottoni*, a West African ratel which had no silver band and was therefore entirely black. As his description was based on a single specimen, he suggested that it might be an individual case of melanism, though this did not prevent him from describing it as a new species.

We now have proof that in Africa one may meet a little-known animal, looking very like a small black bear; and this explains some of the descriptions of the Nandi bear. There is no doubt that what Major Toulson, Captain Hislop and Anderssen's boys saw was a black ratel. A

"round and even podgy" beast, 3 feet long and between 18 and 20 inches high, with short legs and covered with long black hair, a small pointed head, the tail carried like a dog's with non-retractile claws—what else could it be?

Blayney Percival tells how he had to go and inquire in the Sotik country about an animal very like the Nandi bear. It was supposed to be fairly large—the size of a pointer—and it stood on its hind-legs and was very fierce. It turned out when he showed them a picture of the ratel that this was what it was. I think the ratel may also be the answer to the problem of the *too*, an animal Schomburgk heard rumours about in East Africa, "as big as a goat, with teeth like a dog's, dark black fur and an evil character."

Pursuing the question of black ratels I found that the truth was more relevant than I had expected. In 1909 Pocock published a note on the ratels in Africa listing no less than four species, differing only slightly in size and in the extent of the silvery grey band on the back. *Mellivora leuconata*, for instance, had a light strip all along the back, but as it grew older the hindquarters darkened. In the London Zoo was an old specimen with no white except for a crescent on the top of its head, its back being merely sprinkled with grey. He cautiously added that "It may be that the dark hue of the dorsal surface is a sign of age," but did not draw the logical conclusion that differences were not due to different species but to different individuals of different ages. Far from it, he proceeded to describe yet another species, *Mellivora signata* from Sierra Leone, on the evidence of a young specimen in which the dorsal patch was already no more than a crescent on the top of the head.

Soon afterwards Dr F. D. Welch gave a much more detailed account of the changes of colour which a ratel may undergo. He had observed the old specimen in the Zoo for more than 12 years and remarks, "It is now very different from what it was when first observed." When this ratel of the characteristic East African species, *Mellivora ratel*, arrived at the Zoo in 1890 it appeared to be adult. It was therefore more than 20 years old in 1909 when Dr Welch wrote:

> When I first knew it twelve years ago its colour was as follows:—Scalp, back of neck, and dorsal surface were very pale grey with a few black hairs scattered at intervals over the posterior half of the back, no black hairs whatever on scalp, back of neck, and anterior half of back; this dorsal patch of grey was very sharply defined from the black of the under parts by a straight, very distinct line. Tail was quite black on upper and under surfaces, as I shall remark on later.

It was then as large as now, and much larger than a female *Mellivora ratel* which lived with it many years and was adult.

It retained its original colour, not altering in any way, till the beginning of 1907, when the pale grey dorsal patch commenced turning black, the change being very gradual and evenly distributed over the posterior half of the back and not in patches, and later on spreading to the anterior half of the back and neck.

This change went on very gradually, the well-defined margin of the dorsal grey patch at its junction with the black of the under surfaces and limbs and tail becoming gradually lost; the black of the under surfaces, limbs and tail becoming gradually continuous with the new black of the back, leaving only scattered grey hairs mixed with black where formerly there was the well-defined line of all grey hairs.

At present all the back is "black merely sprinkled with grey," as Mr. Pocock remarks, but on the scalp there are more grey hairs in proportion to black than on the body, and the black of the dorsal surfaces cannot now be distinguished from the black of the under parts . . .

Mr. Pocock has suggested senility as the cause of this change, and as the animal is otherwise in good health, I do not think there is any doubt on this point.

Almost entirely black ratels may not therefore necessarily belong to a dubious species (*Mellivora cottoni*) confined to West Africa, nor need they be exceptional melanistic mutations. It seems to be quite normal even for East African ratels (*Mellivora ratel*) to become black at the end of their lives, when their size is largest. The largest ratels are therefore also the blackest, and would naturally not be recognised as the same animal as the young ratels, which are smaller and strikingly marked.

This does not necessarily mean that Sandrart was wrong in thinking the Nandi bear to be a distinct species of giant ratel. Dr Welch has pointed out that the ratel which he watched blackening with age was much larger than another adult ratel living with it. On the basis of the measurements of five living animals and 26 skins and skulls, all from Africa and Arabia, he concludes:

> There is in this species considerable range of size, which in my mind raises the question as to whether the skins hitherto regarded as *M. ratel* may not be divisible into two species differing only in size. However, most of the skulls have no sex stated, so no definite conclusion can be come to on this latter point, as the male would be naturally larger than the female skulls.

In short, some descriptions of the Nandi bear may refer either to very old males of the species *M. ratel* or to elderly individuals of a larger species—or rather sub-species, since there is no reason to create a new

species on the mere basis of size—which I suggest should be called *Mellivora ratel maxima* if its existence is definitely proved.

And there are some fairly trustworthy reports of giant ratels. In 1932 a famous French big-game hunter F. Edmond-Blanc reported in his memoirs of an expedition in Ubangi-Shari:

> The existence of a large ratel was borne out by one I saw; unfortunately I did not have time to fire. I bitterly regretted it because of the beast's size which seemed to me to be really gigantic.

My friend Charles Dewisme has suggested that the legend of the Nandi bear may be based on two separate animals: the spotted hyena and the ratel, the hyena's bloody deeds being attributed to the mysterious little "bear" which is so rarely seen. It is natural for any little-known animal to be blamed for every crime, just as a stranger in a village is always the first to be suspected.

Patrick Bowen has suggested to Frank Lane that the Nandi bear may be a scapegoat in a more sinister sense and that native witch-doctors may well be responsible for the massacres attributed to the mysterious animal. They are very clever at imitating animals' cries and making false tracks as a means of stealing cattle and revenging themselves on their enemies with complete impunity. Just as in the Belgian Congo and Nigeria there is a secret society of leopard-men called Aniotos, and in Europe in the Middle Ages there were men who were werewolves, there may well be a sect of bear-men, based on Arab folklore, hyena-men, or even ratel-men in Kenya and Uganda. The Aniotos cover their heads and backs with leopard-skins and use mummified paws on the end of sticks to imitate the beast's tracks. They attack their enemies at night and maul their necks with gauntlets armed with iron claws, thus producing horrible wounds indistinguishable from those made by a large cat. In the same way they might easily imitate the bear's method of killing.

This would explain those native descriptions of the *chemosit* as half-man, half-bird, with an ape's head and walking upright. And the footprints like those of an old leopard which could not draw in its claws properly could well have been made by a lion's foot stuffed with straw or sand, or worn on the real criminal's foot. All this is pure conjecture. But the terrible atrocities of the Mau-Mau in Kenya have shown the cruel lengths that the Kikuyu would go to, and make this theory all too possible.

Actually there is no need to consider the ratel as a harmless scapegot blamed for hyenas' or witch-doctors' misdeeds. It is not always so

harmless. True, it is fond of honey (like the bear) and also feeds on small mammals, birds, reptiles and insects (also like the bear). It is one of the poultry-farmers' worst enemies. In Algo-abai, where the peasants were battling with it over the eggs their hens had laid, it won the day by breaking all the hens' necks one night—there were some 30 of them—and carrying off three to its lair. The pygmies' report of seeing it at grips with an antelope shows that it will attack animals much bigger than itself. Brehm says that "at the time of rut it is so excited, so furious, that it will even attack man and bite him savagely."

Guy Babault, a French naturalist who has been observing the fauna of Central and East Africa for 30 years, writes of the ratel:

> The courage of this little animal is unparallelled. A lion will let a determined man pass, but not the ratel. When disturbed it will attack and only retreat in order to return more bitterly to the charge. It is wonderfully tenacious and brave. Moreover it is armed with strong jaws and powerful claws, for it is a burrower that can dig itself deep earths.

Professor Pierre Grassé notes in his monumental *Encyclopédie de Zoologie* that "Besides honey and brood-comb the ratel eats insects, small mammals and even small antelopes." Its lust for meat must sometimes be very violent, since in India it has the odious reputation of stealing corpses from cemeteries. It is as gluttonous as the hyena, whose cowardly thirst for blood often drives it to attack solitary or sleeping people.

This behaviour is not surprising. The ratel belongs to a very fierce family of carnivores. The Mustelidae have not the panther's or the tiger's reputations only because they are smaller. But relative to the size of their victims, they are really much more cruel, fearless and aggressive than the felines. The wolverine or glutton (*Gulo luscus*) of the arctic, which is no bigger than a large ratel, well deserves its name, since it lives upon large herbivores like the reindeer and even small elk. The tiny stoat (*Mustela nivalis*), hardly 15 inches long, is even more voracious. It has been known to attack horses and cows and even man, causing frightful wounds. Nothing can be more sadistic than the stone-marten (*Martes foina*), which causes wholesale massacres among the inhabitants of hen-houses and rabbit-warrens, without the least excuse, since it carries off only one of its victims. Finally the badger, the nearest approach to a ratel in Europe, is justly renowned for its courage. I have even found a case of one attacking a young man. It is described thus by Jean Mathis, the victim's father:

I recently sent my fourteen-year-old son to draw water in a pasture 600 yards from the farm. The boy fell off his bicycle on the way; he got up unhurt, but was not a little surprised to see a greyish brown animal charging at him, snarling and showing its teeth. Leaving his bicycle on the ground, my son took to his heels with the animal just behind him, climbed over a fence and ran towards a hut where he hoped to take refuge; but he was still pursued and had to run round the cabin several times with the beast at his heels. Finally he managed to get hold of a large stick and to give the animal a heavy blow on the skull. He only succeeded in increasing its fury and a desperate battle ensued until the beast was completely stunned.

It was a male badger, about a year old and weighing 16 pounds. In all my experience of hunting I have never before heard of such a pugnacious badger.

All of which shows that a large ratel about the size of a wolverine might well kill pigs, sheep and even cattle; and that it might possibly kill a man.

Moreover the ratel is one of the few mammals one might suspect of penetrating a wall of thorns to reach its prey. Its dense fur and a thick layer of sub-cutaneous fat make it impervious to the stings of wasps and bees when it raids their nests. Brehm reports that the Indian ratel

> prowls round native dwellings at night; it passes through thick thorn hedges, or burrows an underground passage beneath them. In ten minutes it will dig such a passage into the hen-roost which it is raiding.

The African ratel, which is larger and stronger than its Indian cousin, could well kill much larger prey. But could it carry them off? The following passage from Frank Lane's *Nature Parade* may provide an answer:

> It is an interesting fact that strength in the animal world seems to increase in inverse proportion to the size of the creature. Big-game hunters say that a large carnivore is capable of carrying a full-grown bullock over a five-barred gate practically without pausing in its stride . . . But such a feat is eclipsed by a weasel dragging a hare. Worked out on the basis of cubic capacity, the smaller animal's feat is equivalent to a lion dragging an elephant at five miles an hour.

In its method of killing its prey by a blow with its paw on the top of the head and then disembowelling, the Nandi bear is much more like an animal with powerful claws, like the ratel, than one with powerful fangs, like the hyena or lion. The ratel is therefore perfectly capable of committing many of the misdeeds attributed to the Nandi bear.

Bears, which are usually peaceable and gentle and live on fruit and

insects, sometimes become complete carnivores when they are old solitary males, and none but old bears are ever dangerous to man. Might not the same be true of ratels, whose habits are relatively little known, but which are closely related and very similar in appearance and behaviour?

This theory is now a simple demonstrable theorem:

The Nandi bear is described by the Kenya settlers as a small black bear of bloodthirsty habits. But a dangerous black bear is an altogether unusual sight in Africa.

When a ratel grows old it changes so much in its appearance and its nature that it is also a very unusual sight.

Now when an old ratel turns black all over, reaches its full size and becomes a more bloodthirsty carnivore, it looks and behaves just like a small black bear.

Therefore the Nandi bear is an old ratel. Q.E.D.

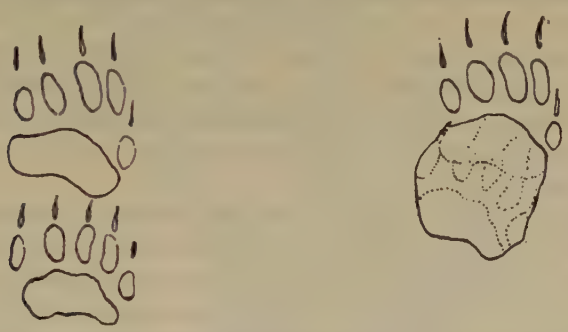
Of course this theorem is valid only if you begin by accepting that the Nandi bear looks like a small black bear. As I have already shown, the settlers have often used the name for an animal which seems more like a giant baboon. Moreover the *chemosit* or *kerit* is described by the natives as a big hairy biped, and the *koddoelo* as an enormous baboon. I believe the whole confused question of the Nandi bear was based on a misunderstanding.

When Geoffrey Williams and his cousin saw a strange animal, which I think may have been a giant baboon, they compared it to a bear. The natives to whom they described it claimed to know the beast and to know it by the name of *chemosit*, but Williams did not realise that they considered it to be a sort of devilish ape. When Hickes saw a similar animal beside the Magadi railway, the previous encounter came to mind, and word got around that there was a sort of bear in Kenya. At once a whole string of people, Major Toulson, the Dutchmen on the Uasin Gishu and several other witnesses who doubtless had met large black ratels, confirmed the truth of this rumour, which was supported by the fact that the Wa-Swahili knew an animal which they called *duba* from the Arab name for bear. No doubt this was also the ratel.

Finally some plantigrade footprints were found which might have been made by a giant baboon, a monkey that sticks to the ground and has a big toe a little splayed from the rest, by an aardvark, or by a giant ratel, a beast which is almost as plantigrade as a bear. In any case when the ratel puts its hind-foot down very close behind its fore-foot, as it

generally does, it makes a composite print remarkably similar in shape to the one discovered near the Magadi railway.

So the picture of the Nandi bear became blurred and confused, and people began to imagine that any beast they did not recognise must be the mysterious animal. Corbett, handicapped by having forgotten his spectacles, was one of these. He describes a not very heavily built animal with largish ears, not in the least like either a baboon or a ratel, but



100. Badger's footprints. *Left:* separate prints of fore-foot followed by hind-foot. *Right:* composite print formed when they overlap.

which may well have been a Cape hunting dog (*Lycaon pictus*) or even a brown hyena. The white spots on this hyena's limbs might account for Corbett's "slight streak of white down the hindquarters." And, of course, the settlers who saw an unusually red hyena, or a little-known brown hyena, added it to the Nandi bear's confused dossier. Any bloody raid made by a hyena or other man-eater, and any slaughter of cattle or men by a "brain-eating" maniac, whoever he may be, would be attributed to the legendary bear without the least proof. And perhaps witch-doctors took advantage of this atmosphere of terror to carry out their own crimes, leaving false clues and further confusing the affair.

The Nandi bear is now a bear no more. It is a whole Apocalypse of beasts, and an Apocalypse as obscure as St John's. All the same I trust I have been able to disentangle the four horsemen: the giant baboon, the old black ratel, the unfamiliar hyena and the witch-doctor.

Only the first, the *chemosit*, the Nandi's terrible two-legged demon that prowls at night, is a real mystery. Obviously its nocturnal habits have helped it to remain a mystery. It was for this reason that the okapi was unknown for so long. And the atmosphere of terror aroused by the *chemosit*'s cattle-raids in Kenya did not encourage anyone to capture it

alive or dead. Even so, attempts have been made. Frank Lane tells of an enthusiastic hunter who "was so confident of success that he had a large cage in readiness which required 40 porters to move when empty!" I need hardly say that his optimism was not rewarded. On the other hand, K. R. Williams, who lived in Uganda, is said to have killed a young *chemosit* by accident with some poisoned meat intended for hyenas. One day when he went to examine his traps he found a strange beast lying stiff and dead beside his poisoned bait. It was much larger than a spotted hyena, though it had the same dirty yellow fur. Its head was just like a bear's. An old witch-doctor said it was not a hyena but a beast whose name he did not know. Alas, while Williams went back to his camp to get something to skin it with, real hyenas arrived and carried off this specimen which might have solved one of the most puzzling of zoological mysteries.

Scientists have put forward the most daring theories in their attempts to explain the Nandi bear. In 1923 Dr E. G. Wayland, Director of the Geological Survey of Uganda, made a sensational discovery on the Bunyoro side of Lake Albert in a very recent stratum, probably dating from the Pleistocene. This happened on the scene where the *engargiya* (the local version of the *chemosit*) had committed its crimes. The bone that he disinterred was an incomplete phalanx belonging to a member of one of the strangest groups of mammals the earth has ever known, the Chalicotheria or Ancylopoda.

These Perissodactyls, which are distantly related to the horses, were a headache for the palaeontologists for a long time, because, while they have an ungulate's skull and teeth, their feet have three toes armed with formidable claws. When the first sparse remains of these beasts were discovered in 1823, Cuvier attributed the feet to "a giant pangolin" and the teeth to some sort of Perissodactyl: according to his Law of Correlation between the Organs an ungulate with claws was an impossibility, and his word remained law until the day when a whole skeleton was found. It showed that the pangolin's feet really did belong to an ungulate, despite the Father of Palaeontology's edicts.

It is now thought that the Chalicotheria used their claws to tear down the leaves which were no doubt their food.

The remarkable thing about Dr Wayland's find was that it was the first time that remains of one of the Chalicotheria had been dug up in Africa. Until then several species had been discovered in Europe, Asia and even in America, but never in Africa.

When the precious phalanx reached the British Museum of Natural

History, it was identified without any possibility of doubt by the great expert Dr Charles William Andrews, who was struck by the apparently recent date of the fossilisation. He also recalled that remains of Chalicotheria had been found on the island of Samos, where they were

101. Reconstruction of the Chalicotherium by Professor Othenio Abel, 1920.

associated with those of the Samotherium. They had shared the same habitat as this Greek okapi, so might they not also have a living representative hidden in the African forests?

These clawed ungulates, with their short hind-legs and very sloping back, their heavy head and short tail, must have been very like a hyena in outline—but a hyena as big as a horse. Dr Andrews therefore wondered whether some belated Chalicotherium might not be at the bottom of the persistent rumours in Africa about the so-called Nandi bear.

Of course this indisputable vegetarian could not be saddled with the crimes attributed to the *chemosit*—which could often be due to spotted hyenas. But there is no doubt that if a Chalicotherium were clad in a furry coat—which is pure supposition—it would agree perfectly with

most witnesses' descriptions. And that is all that one can say for the moment.

Science is a long way from officially adding the Nandi bear to the list of African fauna. We have only the most dubious remains of it. Ivan T. Sanderson says that in the British Museum of Natural History there is a piece of fur covered with long brown hair which may come from the animal about which arm-chair experts are so sceptical, but whose existence it is rash to deny in many villages in Kenya.

CHAPTER EIGHTEEN

Mngwa, the Strange One

At night all cats are grey.
French proverb.

It is dawn in a small village on the coast of Tanganyika. Suddenly the silence is broken by a woman's shrill scream. On the still-fresh sand in the market-place lies a shapeless heap of flesh, the unrecognisable body of a man, ripped and pounded to mincemeat by some incredible killing-machine. The scavenging birds fly off their carrion, and one by one the villagers gather round in a circle, silent until one of them notices a few greyish hairs among the drying blood and exclaims: "*Mngwa.*"

The *mngwa* is the most feared of all Africa's mysterious beasts, although the whites do not know it at all, and even to the blacks it is largely a mystery; for its name comes from the Kiswahili *mu-ngwa*, which means "strange one." East African settlers often confuse this animal, which the natives also call *nunda*, with the Nandi bear. But the terrors of Africa do not all come in one shape. Whereas the *chemosit* is a lumbering beast reminiscent of a bear or a huge baboon, the *mngwa* is distinctly feline, a silent machine with muscles like steel springs, controlling an armoury of teeth and claws. And while the *chemosit*'s misdeeds occur all over the interior of East Africa, the *mngwa* is found only along the coast of Tanganyika. If the *mngwa* can be compared to any unknown animal in the uplands it is to the *ndalawo* of the Uganda forests, a savage man-killing carnivore, which is said to be the size and shape of a leopard, but with black fur on its back, turning to grey beneath its body. The *mngwa* is supposed to be larger. The natives who have seen it say that it is as big as a donkey and striped with grey like a tabby cat. It may seem extraordinary that Africa should conceal an unknown feline the size of lion, and Captain William Hichens writes:

> It can be said that such a beast is "impossible"; but, having trekked many a long mile in its reputed haunts and helped to patch up more

than one of its mangled victims, I am convinced that some beast answering to the *mngwa*'s description does lurk in the dense jungle which fringes parts of this coast. Patches of this dark jungle-growth have not been trodden by human foot for centuries, as may be judged from the fact that a large town of ruined stone mansions has stood in the bush not an afternoon's car-drive north of Mombasa, for over five hundred years, and was utterly unheard-of until rediscovered about four years ago [i.e. around 1933].

The *mngwa* appears in many Swahili songs and tales. Hichens quotes a war-song dating from about 1150 A.D.

Sikae muyini kewa kitu duni
Nangia mwituni haliwa na mngwa
(I dwell not in the city to become a worthless idler,
I plunge me in the forest to be eaten by the *mngwa*!)

From the legend of the Sultan Majnún quoted by Edward Steere in his *Swahili Tales*, the beast seems to perform the same function in folklore as dragons did in Europe in the Middle Ages.

One day the Sultan's cat escaped and slaughtered its master's poultry. The Sultan's soldiers asked him if they might kill the cat, but he replied: "The cat is mine, and the poultry are mine."

The cat went on to eat sheep and goats and, presumably growing larger and stronger on this diet, soon was eating cows, horses and camels. But each time the Sultan replied that the cat as well as its prey were his, so there was no occasion to kill the cat—until the day when the cat devoured three of the Sultan's sons. Then he changed his tune: "It is no longer a cat," he said; "its name is *nunda*."

The Sultan's seventh son was a wily and fearless hero. He decided to seek out the monster and kill it. He killed a large dog and came home singing:

Mamá wee, niulága
Nundá mla wátu
(O Mother, I have killed
The *nunda*, eater of men.)

But his mother disillusioned him, and he proceeded to kill a civet, a zebra, a giraffe, a rhinoceros and an elephant, one after the other, thinking each time that he had killed the *nunda*. And each time his mother told him his mistake.

At last, after announcing that he would not return without the *nunda*'s body, he set off into the forest with his servants. And one fine day he saw the monster.

"This must be the *nunda*," he said. "My mother has told me that its

ears are small and these are small; she has told me that the *nunda* is broad and not long, and this is broad and not long; she has told me that it has two blotches like a civet, and this has two blotches like a civet; she has told me that its tail is thick and this tail is thick; and all the peculiarities she told me of are here."

Convinced that this time he was not mistaken, the young man shot the monster with his gun. When he came back his mother greeted him singing:

Mwanangu, ndiyiyi
Nundá mla wátu.
(O my son, it is he
The *nunda*, eater of men.)

The story ends in the usual way: the youngest son inherits his father's kingdom, marries a fair wife and enjoys a long life much loved by his people.

The moral of this interesting legend might well be: Never mistake a *nunda* for any ordinary creature.

What is a *nunda* or *mngwa*? Until the 1920s it was thought to be quite imaginary, but then, as Frank Lane remarks,

> a series of events took place in some of the fishing villages on the coast of Tanganyika which brought the *nunda* from the realm of native fantasy to that of Government reports.

One of these villages was Lindi where Captain William Hichens was Native Magistrate, and where he tells us that the following events took place in 1922:

> It was the custom for native traders to leave their belongings in the village market every night, ready for the morning's trade; and to prevent theft and also to stop stray natives sleeping in the market place, an askari or native constable took in turns with two others to guard the market on a four-hour watch.
>
> Going to relieve the midnight watch, an oncoming native constable one night found his comrade missing. After a search he discovered him, terribly mutilated, underneath a stall. The man ran to his European officer, who went with me at once to the market. We found it obvious that the askari had been attacked and killed by some animal—a lion, it seemed.
>
> In the victim's hand was clenched a matted mass of greyish hair, such as would come out of a lion's mane were it grasped and torn in a violent fight. But in many years no lion had been known to come into the town.
>
> We were puzzling the problem at the *boma* next morning when the old Arab Liwali or native governor of the district hurried into our office

with two scared-looking men at his heels. Out late the previous night, they said, they had slunk by the market-place lest the askari should see them and think them evil-doers; and as they crept by they were horrified to see a gigantic brindled cat, the great mysterious nunda which is feared in every village on the coast, leap from the shadows of the market and bear the policeman to the ground.

The Liwali, a venerable and educated man, assured us that within his memory the nunda had visited the village several times. It was an animal, not a lion or a leopard, but a huge cat as big as a donkey and marked like a tabby. I had heard this tale, and had put it down as silly superstition, but the Liwali's assertion put a different light on things.

That night we kept watch with two armed askaris at the market: nothing happened. On parade next day we read the native constable a lecture on the stupidity of supersitions.

It seemed that we were slightly premature. That same night another constable was torn to pieces, and clutched in his hands and scattered about the buckles of his uniform was more of that grey, matted fur . . .

The native constables refused to mount watch at night, even though the guard was doubled, and no doubt had some pretty caustic things to say among themselves about the stupidity of the white man's scepticism. All the same Hichens was still convinced that the culprit was a lion. He sent the bunch of grey hair, which he thought must have been torn out of the mane, to headquarters for an expert opinion. The reply was: "It was a fur and not a hair as you state: probably cat."

For a month the *mngwa* kept up its terrible depredations in the coastal fishing villages and every attempt was made to kill it. Pits, traps and poisoned meat were set in its way. Armed police patrolled the district. A few cautious sallies were even sent into the skirts of the forest. But the beast went on with its slaughter unseen and untouched. Then as suddenly as they had begun the raids ended—but not for good. Years later they began again, and this time Hichens was less sceptical of the native "superstition." In 1937 he wrote:

Not long ago a man was brought in to me at Mchinga (a small Tanganyika coastal village) on a litter and terribly mauled by some great beast. He said it was a *mngwa*, and as he himself was a brave and skilful native hunter, who had often tracked down lions, leopards and other "killers" with me and other white men, why should we suppose that in this case he mistook a lion or a leopard for some other beast? He had nothing to gain by telling me lies; on the contrary, as a hunter he depended for his livelihood on being absolutely truthful and trustworthy. . . .

Nor is the African native a fool in the ways of the bushveld and its beasts; he does not assert that a beast is a *mngwa* when any old woman

in the kraal could tell by a glance at its spoor or by the way that it attacked that it is a lion, a leopard or a hyaena. Native hunting lore clearly distinguishes the bush beasts. One well-known hunting-song tells of the *simba* (lion), *nsui* (leopard) and the *mngwa* all in one verse, plainly showing that there is no confusion in the native mind between these three great carnivores.

Even Patrick Bowen, who was so sceptical of the Nandi bear, attributing its misdeeds to witch-doctors, was very positive about the *mngwa*'s existence, because he saw its spoor after a raid in which a little boy was carried off by the beast. Bowen and another hunter went to the village where the raid had taken place and followed the culprit's tracks. At first he thought it was a lion, but eventually the track crossed some hard wet sand, where the spoor was exceptionally clear, and then there was no doubt that it was not a lion. "The spoor we were following," he told Frank Lane, "appeared to be that of a leopard as large as the largest lion." The beast's hairs, found on the stakes where the *mngwa* had forced its way into the kraal, were brindled and quite different from a leopard's.

And that is all we know about the *mngwa*. What are we to make of it? It would not be the first strange and unknown feline animal to be discovered in Africa in our time. The story of the *nsui-fisi* is most instructive in this respect. Alarming tales about this beast, whose name means "hyena-leopard," have long been told in Rhodesia, where the natives believe it is a cross between these two carnivores. It is supposed to look like a leopard, but it is striped with black and white like a striped hyena and its claws are not retractile. As one might expect of such a hybrid, it is extraordinarily swift, crafty and ferocious. It always attacks at night, forcing its way through the gates of cattle-kraals or between the branches that form their roofs, turning them into a slaughter-house and always carrying off a goat or a sheep. As usual, the whites disbelieved these tales and thought them mere superstitions.

Then one day in 1926 Major A. L. Cooper saw a most unusual cat-like beast near Salisbury in Southern Rhodesia and immediately shot it. It proved to be a strange animal very like a cheetah but covered with fur as thick as a snow-leopard's and marked with spots which ran together to form stripes. Cooper was puzzled by the beast and wrote to the *Field* (October 1926) suggesting it might be a cross between a leopard and a cheetah. Then other specimens were obtained; they all had non-retractile claws—a feature peculiar to the cheetah—and there was now no doubt that they belonged to a new variety of cheetah distinct from the

one species, *Acinonyx jubatus*, found in both Africa and Asia. R. I. Pocock, the famous British zoologist, baptised it *Acinonyx rex*—or, in plain English, king cheetah—remarking that it was "most extraordinary that so large and distinct a species should remain for so long unknown."

It is not at all extraordinary. As we have seen, it has happened dozens of times; and it will go on happening so long as the whites go on thinking the people they are apt to call "savages" are liars or fools.

Nevertheless it is by no means proved that the king cheetah is a new species. Many zoologists think it may merely be a matter of individuals with abnormal markings. From an evolutionary point of view, the spotted coat of many felines derives from a primitive striped coat; the spots are due to the stripes breaking up. In domestic cats one can sometimes see several intermediate stages between spots and stripes all in the same litter. In the spotted species of felines stripes may reappear as a result of atavism in certain individuals. Thus several very rare cases of striped leopards have been described, and there is no doubt that they belong to the known species.

It is therefore not impossible that striped cheetahs may also be mere abnormalities. The fact that the few known specimens all come from the same area does seem to contradict this theory. But there could well be ecological reasons which favoured these abnormal offspring, or these abnormalities could be connected with the genetical ancestry of a group of animals in a confined area. For instance black panthers are fairly common in Indonesia but very rare in Africa.

The reader may wonder whether the legend of the *mngwa* may not also be based on abnormally coloured individuals of a known feline species. It is possible, but it is hard to see how the odd brindled coat of the "strange" beast could be an individual variation of lion or leopard. The *mngwa* is much more likely to be an unknown species than the *nsui-fisi*.

Perhaps the best observation is yet another line of Swahili, which seems to have been made by some negro Hamlet to a no less black Horatio:

> *Si taajabuni, waana Adanu, mambo yalio duniani*
> (Do not wonder, O sons of men, at the things which are in this world.)

CHAPTER NINETEEN

The Little Hairy Men

Up the airy mountain
Down the rushy glen
We daren't go a-hunting
For fear of little men.
WILLIAM ALLINGHAM.

TERROR is more dreadful when it wears a human face. The werewolf is more fearful than any ordinary wolf, since it is a man turned into a wolf. The most terrifying monsters of antiquity had human features: the Cyclops, the Sphinx, the sirens, the Gorgon, the manticora and the innumerable host of ghouls, vampires and harpies. The most successful horrors manufactured by the film industry, Frankenstein's monster, Mr Hyde, Dracula and the Phantom of the Opera, all have human faces. It may seem paradoxical that we should be most frightened by something most like ourselves. But while mere brutality is the act of brutes, evil is the prerogative of man.

This explains why the Nandi make their most feared animal, the *chemosit*, so man-like—while on the other hand the man-like anthropoid apes are unduly dreaded as "man-faced monsters." In the areas where they live they are often feared by the natives, and credited with the most evil instincts; naturalists and explorers are usually powerless when the natives are too frightened to help. And of course these great apes' intelligence enables them to elude our attempts to observe or approach them, which also helps to prolong our ignorance, thus giving rise to much confusion.

The mountain gorilla, which is the largest of all, the pygmy gorilla, which has never been observed in nature and of which we have only a few skins and skeletons, and the pygmy chimpanzee were still unknown in the last century. So it is not impossible that Africa still hides some anthropoids unknown to science.

By far the most mysterious of African tales about man-faced monsters are those about the *agogwe*, little hairy men, barely 4 feet high, which walk on their hind-legs. Captain Hichens, whom I have had several occasions to quote, tells how:

> Some years ago I was sent on an official lion-hunt to this area [Ussure and Simbiti forests on the western side of the Wembare plains] and, while waiting in a forest glade for a man-eater, I saw two small, brown, furry creatures come from the dense forest on one side of the glade and disappear into the thickets on the other. They were like little men, about four feet high, walking upright, but clad in russet hair. The native hunter with me gazed in mingled fear and amazement. They were, he said, *agogwe*, the little furry men whom one does not see once in a lifetime. I made desperate efforts to find them, but without avail in that wellnigh impenetrable forest. They may have been monkeys, but, if so, they were no ordinary monkeys, nor baboons, nor colobus, nor Sykes, nor any other kind found in Tanganyika. What were they?

When he made inquiries in the neighbouring villages, the natives told him the strangest stories about the *agogwe*: if you put a large gourd full of *ntulu* beer and a bowl of food in the grain plantations, these little men would collect these gifts and come and weed and hoe at night to show their gratitude. "That," remarks Hichens, "I can well believe, is myth; but my little brown men were real enough."

Personally I find this legend disturbing, to say the least. It is like those in northern Europe about those elves called leprechauns in Ireland, brownies in Scotland and *nutons* in Scandinavia. Unless they are all based on authentic and similar facts it is hard to see how they could have arisen independently in countries as far apart as northern Europe and East Africa. And as to these facts, let me recall the discovery at the end of the last century at Schweizersbild near Schaffhausen in Switzerland, of bones of tiny men, pygmies of the Later Stone Age. Kollmann, who examined the bones, maintained that they were certainly not pathological dwarfs. James Geikie, the Scottish geologist, has written:

> It is possible, as Dr. Nüesch suggests, that the widely-spread legend as to the former existence of little men, dwarfs, and gnomes, who were supposed to haunt caves and retired places in the mountains, may be a reminiscence of these Neolithic pygmies.

But that is another story.

The East African leprechauns seem to be more than a reminiscence. S. V. Cook wrote as follows in the *Journal of the East Africa and Uganda Natural History Society* in 1924:

Fifteen miles east of Embu Station there rises from the Emberre Plains the lofty hills of Kwa Ngombe, nearly six thousand feet high. They are inhabited, the Embu natives say, by buffalo and a race of little red men, who are very jealous of their mountain rights. Old Salim, the interpreter at Embu, tells me with great dramatic effect how he and some natives once climbed to near the top when suddenly an icy cold wind blew and they were pelted with showers of small stones by some unseen adversaries. Happening to look up in a pause in their hasty retreat, he assures me that he saw scores of little red men hurling pebbles and waving defiance from the craggy heights. To this day even the most intrepid honey hunters will not venture into the hills.

Cook naturally disbelieved this story and thought it no more than a charming fairy tale. But Hichens's report puts it in a different light. After all the Kwa Ngombe hills are only 350 miles north-east of the Ussure and Simbiti forests.

In support of Hichens's story, Cuthbert Burgoyne wrote a letter to *Discovery*, in which it had appeared. This was published in a subsequent issue, and the gist is as follows:

In 1927 I was with my wife coasting Portuguese East Africa in a Japanese cargo boat. We were sufficiently near to land to see objects clearly with a glass of twelve magnifications. There was a sloping beach with light bush above upon which several dozen baboons were hunting for and picking up shell fish or crabs, to judge by their movements. Two pure white baboons were amongst them. These are very rare but I had heard of them previously. As we watched, two little brown men walked together out of the bush and down amongst the baboons.

There were certainly not any known monkey and yet they must have been akin or they would have disturbed the baboons. They were too far away to see in detail, but these small human-like animals were probably between four and five feet tall, quite upright and graceful in figure. At the time I was thrilled as they were quite evidently no beast of which I had heard or read.

Later a friend and big game hunter told me he was in Portuguese East Africa with his wife and three hunters, and saw a mother, father and child, of apparently a similar animal species, walk across the further side of a bush clearing. The natives loudly forbade him to shoot.

Now there is no known ape, even among the anthropoids, which normally walks upright on its hind-legs. While a monkey may stand up on its hind-legs for a moment, the position is unusual, if not uncomfortable. In fact only the gibbon, which is found only in the Far East and the Malay archipelago, is a biped, its long arms acting as balancing

rods; but it is specially adapted to swinging from its arms in trees and rarely descends to the ground.

Perhaps the *agogwe* are therefore really little men. Their description seems at first sight to apply pretty well to the African pygmies. Pure-blooded pygmies are never more than 4 feet high, and their bodies are not so smooth as those of the other Africans. Their skin, sometimes very dark and dull, but more generally a reddish or yellowish brown, is covered with yellow down, especially on the back, arms and legs. Their short and woolly hair is a dark rusty brown. Their arms are relatively long and their legs short, like those of some monkeys.

It may seem odd that these little men should live on good terms with baboons—but it would not be miraculous. If all wild animals run away from man, it is man's fault, since he cannot see a wild animal without using it as a target. But in uninhabited countries, like the Antarctic, we find that seals and penguins and many other animals can be man's neighbours without being afraid or hostile. The same is true in Buddhist lands where all animals are sacred.[1] Some supposedly savage beasts even seek man's company, and it was only after much treachery on man's part that he broke off relations with the puma, which the first travellers called *el amigo del Christiano*, the Christian's friend.

It would not be so very extraordinary to find unknown tribes of pygmies in Tanganyika or Mozambique, where there is thick forest, which is the pygmies' favourite habitat. Driven southward and eastward by the Masai, they could easily have reached the great lakes.

Georges Sandrart who used to be the Resident in Ruanda-Urundi has suggested to me that the little men could equally well be full-blooded Bushmen, who are hardly taller than the pygmies, varying in height between 4 feet 8 inches and 5 feet 2 inches. Their skin is the colour of light tan leather, much lighter than the rest of the Africans. It is true that today pure-blooded Bushmen are confined to the Kalahari Desert, driven there by the Kaffir tribes. But they once covered a very large area and many tribes know them. The Zulus call them *Aba-twa*, the Bechuana *Ba-roa* and the Hottentots *Saan*. The influence of their language is found in place-names all over Africa south of the Zambezi. Sir Harry Johnston has even found their characteristic stone implements farther

[1] "One of the charms of this strange country is the friendly terms on which the Tibetans live with wild animals; which are of course never hunted in Buddhist countries. Riding along on a pony one often got quite close to them—hares, marmots, foxes, otters, wild asses, and once even a magnificent leopard; *homo sapiens* did not worry them unduly, for they had been taught no reason to fear him."—André Migot in *Tibetan Marches*.

north at the northern end of Lake Nyasa and even at the southern tip of Lake Tanganyika. The stones, rounded in a special way and pierced with a hole to take a stick, were used by the Bushmen to dig up the wild roots which are part of their food. These stone-age men rarely build a hut and prefer to live in holes dug in the ground or in natural caves; their habits in fact agree very well with the description of little men living in complete savagery.[1]

It is easy to see how one party of Bushmen could have taken refuge in the forests of Mozambique and Tanganyika while another went to the Kalahari Desert. But their very bare and quite hairless skin makes them poor originals for the *agogwe*—hairy little men. In any case the East African negro traditions make a clear distinction between the pygmies and these small bipeds which they think are nearer monkeys. Here again I must quote Roger Courtney's guide, Ali: "But have you heard," he asked his master, "of the little people who live on the Mau—small men, who are less men than monkeys? Less than shenzi,[2] these little men, and almost monkeys in their lives and ways." And he went on to tell how his own father, who was driving his sheep to pasture on the slopes of Mount Longenot, fell into the hands of these gnomes when he went into a cave, following the trail of blood left by one of his cattle that had been stolen. He was stunned from behind, and when he came round he found he was surrounded by strange little creatures. "The Mau men were lower even," he told his son, "than those little people of the forests [the pygmies] for, though they had no tails that I could see, they were as the monkeys that swing in the forest trees. Their skins were white, with the whiteness of the belly of a lizard, and their faces and bodies were covered with long, black hair." To his great surprise the shepherd noticed that his spear was still lying at his side. "The Mau men who are so nearly monkeys did not know what was the spear. It is possible they did not know I could have fought with it and killed many of them."

This may be only a legend, or rather a tale based on much-distorted fact. Obviously the Mau men with their white skin and black hair hardly agree with the brown or reddish *agogwe*, but it has been found time and again that African legends contain a grain of truth. Some other much

[1] Jacques Mauduit, who went on the Panhard–Capricorne expedition to the Kalahari Desert, reports that "an old Bushman said that he was able to understand the baboons' present language." This would imply neighbourly if not friendly relations between Bushmen and baboons.

[2] Wild men. Just as the Greeks thought all foreigners were barbarians, the African tribes think outsiders must be more primitive than themselves.

more detailed reports from a part of Africa about 3,000 miles from the *agogwe* country may be more helpful.

In the Ivory Coast, almost at the opposite end of Africa, there is a legend of reddish hairy dwarfs identical in every respect with that in Tanganyika, as I learn from private information kindly supplied by Professor A. Ledoux of the Faculty of Science of Toulouse University. In 1947 he was the head of the Zoological Department of the Institute of Education and Research at Adiopodoumé, which was then being formed 12 miles from Abidjan.

One evening a young African who worked in his laboratory came and saw him after dinner and went rather furtively about asking him the simple question whether there were pygmies in Africa. The professor told him that they were found in Central and Equatorial Africa and lent him a book on the subject. All the same he was puzzled at his conspiratorial manner and asked him why he wanted to know. Because, the African replied, one of his colleagues in another scientific department of the Institute had seen one not far away on the previous day.

The professor raised his eyebrows.

"A pygmy, here?"

"Yes, about 500 yards from here."

The professor nearly fell out of his chair in surprise. The Institute was surrounded by forest, but though it was thick in places it was very well known and natives were constantly passing through it. The story seemed most suspect.

"Why didn't your friend come and tell me at once?" he asked suspiciously.

The young man explained that since the whites disbelieved the rumours about pygmies in the neighbourhood his friend had been loath to be laughed at or thought to be mad. But he knew the man well enough to know that he had not made it up, so he decided to make inquiries for him himself.

Professor Ledoux was more and more intrigued and insisted that the eye-witness should come and see him. He promised that he would not make fun of him and would not tell anyone of his story.

> The next day [the Professor tells me] I had a visit from the boy responsible for the observation. He was well-educated and had a certificate for primary studies. I asked him about the circumstances in which he saw the "pygmy."
>
> It had happened near the Meteorological set when they were taking their daily readings at 8 o'clock in the morning. Among the roots of a

silk-cotton tree [*Bombax*] there suddenly appeared a little man with long reddish fur and long hair on his head—"same like white man"—but also reddish.[1]

At once the little red man and the large black one took to their heels in opposite directions. For, according to the legends, the little forest-men brought bad luck. You only saw them once in a lifetime and you had to be alone.

I went to the place with my two informants. It lay in the shadow of thick forest, but was not too overgrown since the silk-cotton tree grew near a path. It was very likely that if there had been anything there it would have been easy to see.

I asked to be informed at once if a similar meeting occurred again, but this never happened.

Professor Ledoux admits that he was then very incredulous. It seemed unthinkable that within 12 miles of a big town like Abidjan, and 500 yards from huts inhabited by six Europeans and some 300 Africans, there could be unknown creatures in forest which though thick was far from virgin. Moreover the African who claimed to have seen the mysterious pygmy did not come from the Lower Ivory Coast but from the Middle Coast, which is wooded savannah country. Perhaps the great forest, which is most impressive, had over-excited his imagination. And in his solitary walks in the forest the professor had often put up bush-buck. If the African had seen the russet back of one of these antelopes among the bushes it was not impossible that his imagination should have led him to think that it was one of the "little hairy men" of the legends. At all events when the professor showed him a book containing pictures of Central African pygmies he insisted that his creature was not like them.

Despite his scepticism Professor Ledoux decided to make discreet inquiries about the native legends and what they were based on. He questioned several Africans who trusted him, and he pretended that he fully believed their stories, thus putting them at their ease and getting much more detailed information. In this way he came to visit most of the neighbouring villages.

As a matter of fact I did not obtain any important information, for while there were plenty of men who "had seen" (?) them, they were reticent on the subject, always concluding that they were probably mistaken for all the encounters had taken place at nightfall. This is likely enough.

[1] The long hair on the head, like a European's, was reported by all the Africans Professor Ledoux questioned. This feature could obviously not apply to true pygmies.

There was one relatively exact fact. In March 1946 a team of workmen under one Djaco—who later became my lab-boy and my informant and who died of poisoning in 1949—together with a European of whom I can find no trace, were supposed to have seen one of these little red men, at about 8 in the morning, in a tall tree in a very wooded little valley about half a mile from the future site of the station. The European asked what it was and the negroes explained what a rare thing it was to see such a creature and the evil effects of doing so.

I was at once deluged with stories of dwarfs with their feet back to front, people who lived half in the lagoon and half on land (I think that manatees must be responsible for this legend). These tales were of no interest to me, but I mention them so that the record should be complete.

He then questioned the Europeans who had travelled in the Ivory Coast:

One of them told me the following:

During one of his expeditions in the course of 1947 the great elephant-hunter Dunckel killed a peculiar primate unknown to him; it was small with reddish-brown hair and was shot in the great forest between Guiglo and Toulépleu, that is, between the Sassandra and Cavally rivers. Its remains disappeared while it was being carried home, no doubt having been disposed of by superstitious porters. Dunckel even offered to take my informant to the place and he in his turn invited me to go with them.

Unfortunately this expedition never took place for practical reasons. All the same I doubt whether it would have been successful since encounters with the animal were so rare.

In 1951 the professor's new boy, in reply to his usual barrage of questions, told him that when he was young, probably around 1941, he had himself seen a hunter at Seguéla bring back a little man with red hair in a cage. The local official had put clothes on it for decency's sake and sent it to Abidjan by way of Bouaké. The boy did not know what happened to the little prisoner afterwards.

This tale seems to me to have been embroidered somewhat. If the creature was really human it would not have been put in a cage, and if it was an ape the official would not have worried whether it was decently dressed. Either it was a creature half way between man and an ape, or more likely, it was an unknown primate which had been dressed up as a joke, as tame monkeys so often are.

Professor Ledoux remarks that these tales of an unknown reddish-brown primate in the Ivory Coast are overlaid with the very firmly held belief that there are pygmies in the forest between the Sassandra and Cavally rivers.

According to an African technician of mine from Toulépleu called Méhaud Taou, an intelligent boy keenly interested in these questions, there was recently a system of barter between the negroes and these forest creatures; various manufactured goods were left in the forest in exchange for various fruits. This was supposed to have gone on until 1935. The little men who practised this barter were hardly known even to the negroes themselves. The Guérés called them *Séhité*.

It is possible that these *Séhités* may be true pygmies like those in Central Africa.

The professor's inquiries among the Europeans brought out a significant fact. Those who had never spent any length of time between the Sassandra and the Cavally denied out of hand that there could be any little men in the forest, whether they were true pygmies or unknown primates. On the other hand those who had lived in this area were seriously prepared to consider that pygmies might have lived there in the past and also that there might be a real basis for the legend of the red dwarfs. His own impression was that the legends and rumours in the Ivory Coast were based on the fairly recent presence of pygmies and the present existence of reddish-haired primates whose exact nature was still problematical.

Although the "little hairy men" reported in Mozambique and Tanganyika as well as the Ivory Coast agree with nothing known to the zoologist or the anthropologist, their description could not agree better with a creature well known to palaeontologists by the name of Australopithecus, which was still living in South Africa, not more than 500,000 years ago, at a time when all the existing African species were already formed.

The Australopithecus, which once lived on the grassy plains in the valley of the Vaal, was a little creature, about 4 feet high, with a face like a chimpanzee, although its dentition was almost human, but which walked upright on its hind-legs and was proportioned like a miniature man. The first skull of one of these odd gnomes was discovered in 1924 at Buxton in the Taungs area of British Bechuanaland by men quarrying limestone in one of the caves filled with chalky tufa which have been exploited in the broad Harts River valley since the first world war. The skull, which was embedded in a block of stone, was sent to Professor Raymond Dart of the University of Witwatersrand, who gave its owner the name of *Australopithecus transvaalensis*. It was so strikingly human that the people who found it are said to have thought it was a Bushman's. Professor Dart maintained that this creature had a much better claim

than the Java ape-man to be considered as the "Missing Link" between the great apes and man.

At first sight the skull seems to be merely a juvenile chimpanzee's, and a study of the teeth shows that this specimen was about six years old. But a more thorough examination reveals that the cranial capacity of 500 cc. is much greater than that of a chimpanzee, in which the male averages 370 cc. and the female 280 cc. Indeed it is as great as in the gorilla, where the female averages 450 cc. and the male 510 cc., although its body is so much smaller. In a fully grown specimen the cranial capacity might reach 650 cc., as subsequent palaeontological discoveries were to show; for the remains of at least 30 Australopitheci have since been found, and they include babies, children and adults.

102. This early drawing of a chimpanzee (after Tyson, 1699) is extraordinarily reminiscent of the modern reconstruction of the Australopithecus (see opposite).

The Australopithecus's dentition is also significant. As in man, the teeth are set in a semi-circle and the canines barely project beyond the others, nor is there the diastema characteristic of the apes, that is to say the gap behind the upper canine to take the lower canine when the mouth is shut.

But the most interesting point is that the hole in the bottom of the skull through which the spinal cord passes is farther forward than in the anthropoids. This shows that the head, like a man's, sat plumb on the top of the spinal column and implies that the Australopithecus stood upright. This is also confirmed by the pelvis. There is no doubt that this little large-brained chimpanzee walked on its hind-legs.

It is true that the relatively large volume of brain is only a rough indication and no proof of a higher mentality. But other evidence seemed to show that its intelligence was higher than any recent anthropoid's. In 1948 Professor Dart found fairly complete remains of an Australopithe-

cus at Makapansgat in the heart of the Transvaal. With these fossils were some remains of charred bones and some charcoal. The professor therefore concluded that the Australopithecus knew how to use fire, on the strength of which he named it *Australopithecus prometheus*.

There was no sign that this creature had stone tools or weapons, but Professor Dart thought that it made clubs of the femurs of animals it killed, for these long bones were found with knobs at the end apparently battered with use. The Australopithecus was believed to eat antelopes, since their bones were found in its dens, but as it could not have caught such nimble-footed creatures with nothing but a club, one could only suppose that the little ape-men hunted in a pack and either surrounded their prey or drove it into a blind alley—which clearly showed they had social habits.

103. Reconstruction of the Australopithecus by Roy Chapman Andrews (1945).

Baboons' skulls, smashed in a peculiar way, and found with the Australopithecus's remains, seemed to imply that it ate its victims' brains. But Australopithecus skulls were also found to be similarly crushed, which led some authors to suppose that this little Prometheus was also a Cain and a cannibal. Many primitive peoples eat their neighbours' brains, especially in Borneo and New Guinea, where it is a magic rite by which one ingests one's enemy's spirit. Some would have it that the Australopithecus had no less metaphysical reasons for its behaviour; but since the baboons had suffered the same fate, perhaps it just liked the taste of brains.

Other authors suggested that the baboons and the Australopitheci had *both* been killed and eaten by man—much to the indignation of the South African anthropologists, who were determined that their little *protégé* should be the "Missing Link," the direct ancestor of man, and insisted that he belonged to the beginning of the Pleistocene period, nearly 2 million years ago.

Actually the Australopithecus's remains were found in caves and not in geological strata, so that it is very difficult to reckon their age. The estimates are based on the kinds of animals found with them; but this method has not the slightest scientific value, since it is impossible to state for certain the date at which a species became extinct. Today many palaeontologists admit that the Australopithecus must have been contemporary with man,[1] indeed man has been blamed for its extinction.

Loren C. Eiseley, head of the Anthropological Department of the University of Pennsylvania, affirms

> That the Australopithecines have vanished while many simple arboreal relatives of ours survive is not surprising. The man-apes tried to occupy the same environmental niche as man, and as a consequence man destroyed them.

This mass-extermination cannot have happened more than 500,000 years ago.

But if the Australopitheci were really as intelligent as everyone thinks they were, would they have let themselves be killed without flinching? Surely, like many less cunning animals they would try to move out of range of an obviously stronger enemy, by taking refuge in a less agreeable but safer area. Since man meant to be master of the plains, the little hairy hordes would have adapted themselves to the forest, just as the East African pygmies were to do when driven by the invading Masai. The forest would have suited such ape-like creatures well.[2]

In the thick forests of Africa, the last refuge of so many "relic" species, might not the Australopithecus's descendants still survive? Certainly the *agogwe* are extraordinarily like Dart's "intelligent, energetic, erect, and delicately proportioned little people." And the account of them mixing freely with baboons agrees with the fact that the two creatures' remains are so often found together. Perhaps there might be some sort of "gentleman's agreement" between these two very distantly related primates to live together in a sort of symbiosis, so frequent among animals. The baboons have a more highly developed social instinct than

[1] This was confirmed in 1954 by a study of the sites by Dr Kenneth P. Oakley, an anthropologist from the British Museum, who believes that the Australopithecus did not live in the caves, but was killed and taken there by beasts of prey. The layer of ashes—what is solemnly called the "basal hearth"—upon which the name *prometheus* rests, was analysed and shown to be bats' dung which had probably ignited spontaneously!

[2] Oakley thinks that even in South Africa man lived along the river-banks while the Australopithecus dwelt in the bushy gorges called *kloofs*.

any other monkey; the structure of their societies, which Professor Sir Solly Zuckerman has so carefully studied, is quite complex. Many authors have pointed out the astonishing way baboons will help one another in difficulties. They might well extend this spirit of co-operation to another no less social species. A partnership between Australopitheci and baboons would be a good bargain for both. The intelligence and organising mind of the first would be an excellent complement to the brute force and ferocity of the second. The baboon would guarantee his partner's safety, while the ape-man used his ingenious hunting methods to provide food for both. Thus they could have made a common front against that newcomer man with his treacherous traps and strange weapons.

If the *agogwe* are an unknown race of human pygmies living with baboons, they could give us most valuable information about the most primitive of societies and strangest of partnerships. If they prove to be surviving Australopitheci, our present notions of man's origin would surely be radically changed. We should at last know exactly what these so-called ape-men really were. These are important problems which deserve to be solved.

CHAPTER TWENTY

The Dragon St George Did Not Kill

> David Doldrum dreamt he drove a dreadful dragon. If David Doldrum dreamt he drove a dreadful dragon, where's the dreadful dragon David Doldrum dreamt he drove?
>
> *Traditional tongue-twister.*

At half-past eleven on the morning of 23 December 1919 Captain Leicester Stevens boarded the Southampton train at Waterloo station on his way to hunt the Brontosaurus in Central Africa.

"I am leaving for Cape Town on Christmas Eve," he told a newspaperman who followed him to his compartment. "From Cape Town I shall go 1,700 miles north to Kafue, where my expedition will be organised."

His only companion was his faithful Laddie, a former "barrage dog," a mongrel of dog and wolf, which had often carried messages under heavy artillery fire during the first world war, and was to help its master track the monstrous dinosaur and win the million-pound reward offered by the American Smithsonian Institution. Captain Stevens put his trust in his Mannlicher rifle, for the huge reptile was supposed to have a vital spot.

"Where that spot is," remarked the new St George with an unduly mysterious air as the train moved off, "is one of my secrets."

His brown, weather-tanned face broke into a broad smile and his very light blue eyes twinkled as he waved goodbye. He was a tall muscular fellow in his thirties, and seemed perfectly sane.

This story is not a science-fiction writer's dream but is taken from the Press of the time. To go dinosaur-hunting in the twentieth century is surely madness—yet plenty of people were infected by it. When Captain Stevens first announced his bizarre intentions, he was flooded with letters from hunters, sportsmen and bored demobilised officers all asking

to come with him. An old lady who had long been a member of the Wild Birds' Protection Association sent him a four-page letter entreating him to spare the beast's life if he found it.

For several weeks the most exciting news in the papers were Carpentier and Beckett warming up for their famous boxing match and that two different travellers had recently met a prehistoric monster in the Belgian Congo.

On 17 November *The Times* had published a small news item; it was, as usual, under the smallest and most discreetly unsensational of headlines:

A TALE FROM AFRICA

Semper aliquid novi

The *Central News* Port Elizabeth correspondent sends the following:

The head of the local museum here has received information from a M. Lepage, who was in charge of railway construction in the Belgian Congo, of an exciting adventure last month. While Lepage was hunting one day in October he came upon an extraordinary monster, which charged at him. Lepage fired but was forced to flee, with the monster in chase. The animal before long gave up the chase and Lepage was able to examine it through his binoculars. The animal, he says, was about 24 ft. in length with a long pointed snout adorned with tusks like horns and a short horn above the nostrils. The front feet were like those of a horse and the hind hoofs were cloven. There was a scaly hump on the monster's shoulder.

The animal later charged through the native village of Fungurume, destroying the huts and killing some native dwellers. A hunt was at once organised but the Government has forbidden the molestation of the animal, on the ground that it is probably a relic of antiquity. There is a wild trackless region in the neighbourhood which contains many swamps and marshes, where, says the head of the museum, it is possible that a few primeval monsters may survive.

The dinosaur which the animal described in this dispatch most resembles is the Triceratops (Fig. 53, page 188), which was some 19 to 26 feet long, and did have a horn on its nose. But it had "horns like tusks" rather than the other way round, and all four feet were thick and heavy like a pachyderm's. For some reason (mere journalistic ignorance is the most likely one) everyone began calling it a Brontosaurus, though this dinosaur is related to the Diplodocus (Fig. 52, page 188) and shares its characteristically long neck and tail, and, like it, has neither horns nor tusks.

The Brontosaurus seems to have first reared its head in this affair in a delayed Reuter message from Bulawayo, dated 4 December but not

printed in the London papers until the twelfth. It was all the more uncalled for as the beast described in this new report was even more like a Triceratops, or rather its cousin the Monoclonius, the two "tusks like horns" (or vice versa) having disappeared.

> News apparently corroborating the report of the existence in the Congo of a monster known as a *Brontosaurus* (the thundering Saurian) comes from Elisabethville.
>
> A Belgian prospector and big game hunter named M. Gapelle, who has returned here from the interior of the Congo, states that he followed up a strange spoor for 12 miles and at length sighted a beast certainly of the rhinoceros order with large scales reaching far down its body. The animal, he says, has a very thick kangaroo-like tail, a horn on its snout, and a hump on its back. M. Gapelle fired some shots at the beast, which threw up its head and disappeared into a swamp.
>
> The American Smithsonian expedition was in search of the monster referred to above when it met with a serious railway accident, in which several persons were killed.

Now the Brontosaurus, which is a reptile, is certainly not "of the rhinoceros order." As all the rest of the description—thick and powerful tail, large scales on its sides and humped back—seems to refer to some horned dinosaur belonging to the group of Ceratopsians (Triceratops, Monoclonius, etc.), perhaps M. Gapelle meant that it was like a rhinoceros in general size and appearance and particularly in that it had a horn on the end of its nose. Or perhaps "rhinoceros" was a mistake for "dinosaurus" on a bad telephone line? Certainly the animal described is no more like a Brontosaurus than a hedgehog is like a horse. But the news that so important a scientific body as the Smithsonian Institution had sent an expedition on the beast's track would perhaps have allayed the sceptics' doubts. And there was no doubt that this Institution had in fact sent an expedition led by Harry C. Raven to explore this little-known corner of Africa, and that on 28 November the news had come that three of its members—Lendeman, Armstrong and Howell Farr—had been killed in a railway accident in the Katanga area of the Belgian Congo.

Soon the Press was buzzing with the tale that as this disaster had brought the expedition to an end so prematurely, the Smithsonian Institution had offered a reward of a million pounds to anyone who brought the mysterious monster back dead or alive. No more encouragement was needed, especially for men like Captain Stevens, to take up Brontosaurus-hunting, which did not seem so crazy now that various letters were turning up in the Press from old colonials who had also

heard tales from the negroes about the existence of a large unknown reptile in Africa. Walter Winans, a big-game hunter of the highest reputation (according to the Press), said in an interview that the famous animal merchant, the late Carl Hagenbeck, had told him before the war that two of his travellers on different expeditions at different times had seen a Brontosaurus in the swamps of Central Africa. These travellers were used to recognising animals at a glance and their evidence ought to be trustworthy.

One cannot say the same for Winans's zoology. His picture of the Brontosaurus published in the *Daily Mail* certainly looks a terrifying monster, but it is equally unlike the true Brontosaurus and the alleged one described by Lepage and Gapelle. Under the drawing of this mongrel offspring of a lion and a medieval dragon was a caption which must have made the palaeontologists of the time burst their sides with laughing or their blood-vessels with just indignation:

> Mr. Winans, famous as a big game hunter and a world authority on animals, says that the Brontosaurus is a reptile, which crawls on its belly. He believes it is built very light in front, with short rudimentary legs.

This news, and that of Captain Stevens's project, induced a brigadier-general to write to the *Daily Mail* and offer some more sober advice:

> Sir, May I, as an experienced hunter of big game, say that Captain Lester Stevens would do well to take a more effective battery of guns than those described in a recent issue of the *Daily Mail* if he is going to hunt the brontosaurus in Central Africa?
>
> If the animal is anything like the monster conjured up by Mr. Walter Winans, the hunter had better take a Tank instead of his "barrage dog." To receive the charge of eighty feet of primeval monster, armour plated and exuding poison from fangs and skin (Mr. Winans' conception of the brontosaurus), Mannlicher and repeating Winchester rifles are quite inadequate.
>
> I would be sorry to face even a charging tiger with such weapons, while the shot-gun, unless it is for the purpose of scattering salt on the tail of the creature, will prove worse than useless. He should take nothing less than a field gun—say an 18 pounder.
>
> Armed with a Tank, with heavy artillery and with a supply of poison gas, the modern St. George might make "merry music" against this "dragon of the prime," and have a fair chance of taking the million pounds offered by the Smithsonian Institution when he comes galumphing back with the skin. All sportsmen will wish him good sport.
>
> R. G. BURTON.

But the gallant captain did not alter his plans or his armoury.

Meanwhile the world's Press was adding embellishments to the Brontosaurus story almost daily. Lepage and Gapelle were now said to have been together when they saw a beast "like a lizard or a crocodile" which reared on its hind-legs when it saw them. The languid vegetarian Brontosaurus (which looked like a Triceratops) had turned into savage carnivorous Ceratosaurus. Later it was said that Captain Stevens had succeeded in finding the monster, at all events that "he declared he saw it crashing through the reeds of a swamp, and that it was the Brontosaurus—a huge marsh animal, ten times as big as the biggest elephant." The number of members of the Smithsonian expedition killed in the railway accident increased dramatically, and this institution was said to have raised a fund of 5 million dollars to finance the monster's capture.

These tales have been current for so long that now they are sometimes repeated by perfectly serious authors concerned with the problem of unknown animals. Everyone seems to have overlooked or forgotten the following letter, which was published in *The Times* on 23 February 1920:

> Sir, I am authorised to contradict the statement that the members of the Smithsonian African Expedition who proceeded to this territory came here to hunt the brontosaurus. There is no foundation for this statement. I may also state that the report of the brontosaurus arose from a piece of practical joking in the first instance, and, as regards the prospector "Gapelle," this gentleman does not exist except in the imagination of a second practical joker, who ingeniously coined the name from that of Mr. L. Le Page.
>
> Yours faithfully
>
> WENTWORTH D. GRAY
>
> Acting Representative of the Smithsonian African Expedition in the Katanga.
>
> Elisabethville, Jan. 21.

This was enough to discourage the most earnest of dinosaur-hunters and to make a permanent laughing-stock of any naturalist who dared to suggest that prehistoric animals might survive. Similar rumours were still current in much of Africa, and there were always a few people to note them down, but few dared to report them except under their breath. Even the practical jokers thought it wisest to wait until the affair was forgotten before trying to repeat the trick. It was twelve years before a dinosaur-hunt found its way into the Press again.

In 1932 a young South African big-game hunter called F. Grobler returned to Cape Town after five years in Central Africa and told the

Press about a monstrous lizard which lived in the huge marshes where the Belgian Congo, Angola and Northern Rhodesia meet. Different and sometimes contradictory versions of his story were printed in different newspapers—even his name was misspelt [1]—but as I shall later show where he got his information from, this hardly matters. The version of his remarks about the animal which was published in the *Rhodesia Herald* of 15 July 1932 is as follows:

> It is known by the native name of "Chepekwe." The natives in Central Africa used to call it the water lion.
>
> It can best be described as a huge leguan [iguana], the weight of which is estimated at about four tons or more. It was discovered about six months ago by a German scientist in the Dilolo swamps in Angola, and while I was in that country I saw photographs of it.
>
> I went to Lake Dilolo myself to look for it, but I did not see it. The natives say it is extremely rare and seldom seen, but they are convinced as I am of its existence.
>
> It lives only in swamps, and from what I was told it attacks rhino, hippo and elephant. I have seen a photograph of the "Chepekwe" on top of a hippo it had killed.

Grobler also told the Press that he had acted as guide to an expedition led by the famous explorer Hans Schomburgk, who had returned to Germany not long ago, after spending a year filming big-game in Africa. The whole team had gone to the Dilolo marshes in the wild hope of taking some sensational shots of the *chepekwe*, but they did not manage to see the beast.

Grobler's good faith seemed indisputable, and in fact Major Schomburgk had said during a lecture in Germany the previous February that there was a native tradition that a huge reptile existed in Central Africa, adding that the prospect of finding this animal was the one thing that might tempt him to return to this inhospitable wilderness.

> Since he made this pronouncement [the *Rhodesia Herald* goes on] a Swede, J. C. Johanson, who is an overseer in a Belgian rubber plantation in the Congo, wrote to the "Cologne Gazette" from Mai Muene, Kassai district, enclosing photographs purporting to establish the existence of the animal in question.
>
> The photos, so the journal says, were anything but clear, yet they revealed a discovery of great importance. Johanson stumbled on a unique specimen of a dinosaur family that must have lived milleniums ago.

[1] Ivan Sanderson, quoting the *Cape Argus*, spells it "Gobler"—mercifully with only one "b."

I have not so far managed to find Johanson's letter in the *Kölnische Zeitung* (where it may not even have appeared) so I will quote the extract published in the *Rhodesia Herald*:

> On February 16 last I went on a shooting trip, accompanied by my gun-bearer. I only had a Winchester for small game, not expecting anything big. At 2 p.m. I reached the Kassai valley.
>
> No game was in sight. As we were going down to the water, the boy suddenly called out "elephants." It appeared that two giant bulls were almost hidden by the jungle. About 50 yards away from them I saw something incredible—a monster, about 16 yards in length, with a lizard's head and tail. I closed my eyes and reopened them. There could be no doubt about it, the animal was still there. My boy cowered in the grass whimpering.
>
> I was shaken by the hunting-fever. My teeth rattled with fear. Three times I snapped; only one attempt came out well. Suddenly the monster vanished, with a remarkably rapid movement. It took me some time to recover. Alongside me the boy prayed and cried. I lifted him up, pushed him along and made him follow me home. On the way we had to traverse a big swamp. Progress was slow, for my limbs were still half-paralysed with fear. There in the swamp, the huge lizard appeared once more, tearing lumps from a dead rhino. It was covered in ooze. I was only about 25 yards away.
>
> It was simply terrifying. The boy had taken French leave, carrying the rifle with him. At first I was careful not to stir, then I thought of my camera. I could plainly hear the crunching of rhino bones in the lizard's mouth. Just as I clicked, it jumped into deep water.
>
> The experience was too much for my nervous system. Completely exhausted, I sank down behind the bush that had given me shelter. Blackness reigned before my eyes. The animal's phenomenally rapid motion was the most awe-inspiring thing I had ever seen.
>
> I must have looked like one demented, when at last I regained camp. Metcalfe, who is boss there, said I approached him, waving the camera about in a silly way and emitting unintelligible sounds. I dare say I did. For eight days I lay in a fever, unconscious nearly all the time.

Dinosaur-hunters had become better journalists since the days of Lepage and Gapelle, not only in making the most of a sensational story but also in realising the value of pictures. The article in the *Rhodesia Herald* is illustrated with a photograph reproduced from a German newspaper, presumably the one taken by the Swede and referred to by Grobler, though one says the beast it is eating is a rhinoceros and the other a hippopotamus. The photo itself is so indistinct that one cannot possiby recognise the monster's prey. Indeed, there is little doubt that this picture published in several newspapers and magazines is a crude fake. A Komodo dragon has been transplanted somewhat clumsily into an

African swamp scene, where it is perched ballerina-like on the tips of its toes on the carcase of a hippopotamus or rhinoceros, thus making it look enormous. This faked evidence is enough to destroy any remaining belief in the truth of Johanson's story. Once again the dinosaur has proved to be a hoax.

All the same, the hoax has brought to light a few facts which cannot so easily be dismissed. In 1920 Walter Winans had quoted an authority as trustworthy as Carl Hagenbeck. This time Grobler had called on the evidence of the great animal-merchant's faithful agent, Hans Schomburgk. In both cases fact and fiction were closely intermixed, the hoaxers were inspired by rumours founded on authentic facts. Hagenbeck really held the beliefs he was credited with, and Schomburgk had certainly been the first to talk to Grobler about the *chepekwe*, a beast which he had first heard of at the beginning of the century and had mentioned in a book in 1910. Grobler had done no more than to confuse or embroider the facts and make the mistake of thinking that Johanson's letter and photograph were a confirmation of them.

I shall do my best to explain what these facts are—though it will not be easy. I cannot promise that it will be the "sober truth," since the facts are quite as fantastic as the sensational but disappointing stories based upon them. For what could be more fantastic than the fact that Captain Stevens, who set off to the heart of Africa as a result of a double hoax in the hope of winning a quite imaginary fortune, might well have succeeded in capturing a dinosaur and winning immortal fame? At all events the animals we are concerned with in this chapter are, if not actual dinosaurs, large unknown reptiles extraordinarily like them.

Rumours about creatures of this kind have been reported in a ring of country 2,000 miles in diameter encircling the whole basin of the Belgian Congo, the Cameroons, Anglo-Egyptian Sudan, Uganda, Rhodesia and thence to Angola, that is to say in the upper reaches of the Congo, the Nile and the Zambezi.

Before we go into the question of the beast's identity, let us consider the facts, such as they are, without drawing any conclusions and taking care not to mix up reports from widely separated areas nor to assume that all the tales of an "African dragon" necessarily refer to the same animal.

Let us begin a tour of the Belgian Congo, arranging the evidence by place rather than time. We shall start with Alfred Aloysius Horn, whose stilted Victorian narrative of his adventures Miss Ethelreda Lewis

amplified with racy comment, taken down from his own mouth, almost phonetically, and included in his *Trader Horn*. He has this to say about a large water-monster:

> Aye, and behind the Cameroons there's things living we know nothing about. I could 'a made books about many things. The *Jago-Nini* they say is still in the swamps and rivers. Giant diver it means. Comes out of the water and devours people. Old men'll tell you what their grandfathers saw, but they still believe it's there. Same as the *Amali* I've always taken it to be. I've seen the *Amali*'s footprint. About the size of a good frying-pan in circumference and three claws instead o' five. There are some very big lakes behind the Cameroons. Used to be full of nice seal [1] at one time. *Manga*, they call it. But the *jago-nini*'s wiped 'em almost out, the old natives say. . . .
>
> What but some great creature like the *Amali* could account for the broken ivories we used to come across in the so-called elephant cemeteries? Fine old green ivory that's valuable for inlaying wood. Snapped right across in the thickest part and left in splinters. Aye! There's places in Africa where you get visions of primeval force.

Later in the book he returns to the question:

> That *amali*. I told you I've seen a drawing of him in those Bushman caves. I chiselled one out whole once and gave it to President Grant for a souvenir. . . .
>
> Aye, the little fellers that drew those creatures, and manacled slaves and so on I told you about, were not ordinary savages. They sure were paleolithic men from the North. They sure were remembering things, on those walls. . . . Nice little fellers, round about four feet and a little over.

When *Trader Horn* was published it was enthusiastically received as literature, but hardly as scientific fact. Those who knew Africa and its fauna better realised that he was a keen and truthful observer of nature. "Apart from a few unimportant slips the statements made by Trader Horn about the country are generally accurate," writes Dr Albert Schweitzer.

In 1902 Sir Harry Johnston drew attention in his great work on Uganda to the mysterious creature in Lake Victoria, the third largest lake in the world, a vast stretch of water as big as the whole of Eire. It could hardly have come into the world with a more propitious godfather than the man to whom we owe the discovery of the okapi.

> There are also persistent stories amongst the natives that the waters of the Victoria Nyanza are inhabited by a monster (known to the Baganda as "Lukwata"). This creature, from the native accounts, might

[1] The manatee, which is in fact called *manga* by the Bapunu and Eshira.

either be a small cetacean or a large form of manatee, or, more probably, a gigantic fish. So far, however, only one European has caught a glimpse of this creature.

The European was Sir Clement Hill. He told his story to the anthropologist C. W. Hobley, who writes:

> The late Sir Clement Hill was proceding from Kisumu to Entebbe in a steam launch some years ago, and when off Homa Mountain a beast appeared out of the water and tried to seize a native sitting on the bow of the launch. It did not succeed, and Sir Clement (who was under the awning aft) told me that he distinctly saw it some little distance behind the boat; only its head visible, it was of a roundish shape and dark in colour. He was quite certain it was not a crocodile.

This was not the first time that Hobley had heard of this puzzling and impudently aggressive creature. The natives on both sides of the lake had told him of a water-monster which the Baganda called *lukwata*. Ja-Luo fishermen said that it sometimes attacked canoes. At first he thought these tales referred to big pythons sometimes found in the local folk-lore, but later realised it must be an unknown animal.

> Mr. W. Grant, late Provincial Governor, Jinja, once had his attention called to a beast which was swimming down the Napoleon Gulf with its head out of the water, but it was unfortunately too far away to describe.

In 1910 an American sportsman called Edgar Beecher Bronson told an odd story in his book *In Closed Territory*. He was hunting in the country west of Sotik when he met another hunter called Jordan, who told him of an encounter with a terrible monster called the *dingonek*. This took place on the Gori River, which runs into Lake Victoria on the eastern shore near what was then the Anglo-German frontier. Jordan said the beast was 14 or 15 feet long, with a head the size of a lioness's, but marked like a leopard's, with two long, straight, white fangs in the upper jaw. It was covered with scales like an armadillo, as broad as a hippopotamus and spotted like a leopard. It had a long and broad tail. Its footprints were as big as a hippo's, but had claws like a reptile's.

> At the time this story appeared [observes C. W. Hobley] it was considered that this was probably a traveller's tale, told to entertain a newcomer, but I have since met a man who a few years back was wandering about the Mara River or Ngare Dubash which rises in Sotik, crosses the Anglo-German boundary, and runs into Lake Victoria in German territory. He emphatically asserts that he saw this beast. He was at the time about where the Mara River crosses the frontier, and the river was in high flood. The beast came floating down the river on a big log,

and he estimated its length at about sixteen feet but would not be certain of the length as its tail was in the water. He describes it as spotted like a leopard, covered with scales, and having a head like an otter; he did not see the long fangs described by Mr. Jordan. He fired at it and hit it; it slid off the log into the water and was not seen again.

I made inquiries of the District Commissioner, Kisii, Mr. Crampton, and he wrote recently and said he had visited the Amala River and made inquiries from the Masai in the neighbourhood, and they knew of the beast, which they called Ol-umaina, and described it as follows: About fifteen feet long, head like a dog, small ears marked somewhat after the fashion of a puff adder,[1] has claws, short legs, short neck, is said to lie in the sun on the sand by the river-side and to slip into the water when disturbed; when in the water only its head is visible.

This description agrees fairly well with the *dingonek* if not with the *lukwata.*

It turned out that tales about an unknown amphibious creature were found not only in Lake Victoria, but also in some of the rivers that ran into it. Hobley thought that there was a sensational new zoological discovery to be made, and bearing in mind the creature's scales, added: "A survival of some extinct race of saurians is a thing to thrill the imagination of the scientific world." This phrase—and in a scientific journal, too—stuck, and it was no longer a question of a large cetacean or gigantic fish, but "some extinct race of saurians." There were rumours that the officers of a steamer on Lake Victoria had seen a strange prehistoric animal with a long neck in the lake. And Arnold Drummond-Hay claimed to have met a "sea-serpent" on Lake Nyasa.

This only tended to discredit the previous reports, for the experts had no difficulty in showing that what he had seen was merely a large python; for pythons may be more than 20 feet long. Sir Frederick Jackson saw the skin of a specimen 22 feet long killed in the Mabira forest. It must have been almost a foot in diameter. A snake as thick as a man's body would be a most impressive sight. Moreover the python is a good swimmer and seems able to cross wide stretches of water. Colonel C. R. S. Pitman writes:

I have come across this great serpent on Nkosi Island, the southernmost of the Sese group, in the open lake. Unless it had been deliberately placed there by man—which seems unlikely—it must have made numerous water journeys from island to island before arriving so far south.

[1] The puff-adder has no external ears. Perhaps Hobley means the small horns on the horned viper, but the text is by no means clear.

All the same, the first reports quoted above hardly remind one of a python—especially when they refer to the monster's feet! And fuller information came to light to show that this explanation was untenable. In the 1930s Dr E. G. Wayland, Director of the Geological Survey of Uganda, stated that he had been shown a piece of the *lukwata*'s bone. The natives of the Kavirondo country told him that they firmly believed in the *lukwata*; it fought with crocodiles and during the Homeric struggle lost pieces of its skin, which were much prized as amulets. They said that the monster's bellowing voice could be heard a long way off; indeed, Wayland said he had heard it himself. He could not explain these roars unless they were made by the *lukwata*—whatever this beast might be.

Here I should mention that snakes have no vocal cords at all, are quite dumb and can make no noise but a "hiss," which in a large specimen sounds like a jet of steam at high pressure. A bellowing reptile is much more likely to be a large saurian than an ophidian.

In 1923 a study of the Nuer people of the Upper Nile Province was published by the British Deputy Governor, H. C. Jackson. He speaks at some length about an enormous snake, the *lau*, which the Nuer told him lived in all the swampy area of the sources of the White Nile.

> Various fantastic attributes attach to it, which may be mere embellishments on the part of the Nuer without necessarily disproving the existence of some hitherto unknown serpent of exceptional size.
>
> Thus some say that it has a short crest of hair on the back of its head not unlike that of a crowned crane: others that it has long hairs, reminiscent of some of the mud-fish of the Nile, with which it entangles its unwilling victims and drags them into the river. In certain years, particularly during the rainy season, its belly is said to gurgle like the rumbling of an elephant. This noise was heard in the year 1918 in the Bahr-el-Arab.
>
> The Nuer state that it inhabits holes in the banks of rivers or swamps, and spends most of its time in swamps. They are in mortal dread of it, and if they see the furrow in the ground that announces its presence, they run as fast as they can in the opposite direction. If a Nuer sees this serpent before it sees him, all is well, but if the serpent happens to sight even a large party of them first, all are expected to die.
>
> The Addar swamps extend for some 1800 square miles: those of the Bahr-el-Ghazal and its tributaries must cover an area of many thousands of square miles. Neither of these vast morasses has ever yet been explored, and many parts of them have never even been visited. It is therefore not improbable that some addition to our zoological knowledge may ultimately come from these places.

There are so many stories of this creature from places as far apart as Bahr-el-Arab, Addar swamps, Bahr-el-Ghazal and Bahr-el-Zeraf, that it is difficult to dismiss as untrue the existence of some hitherto unknown serpent not unlike a gigantic python. The existence of a bone or hornlike substance near the tail would illustrate a step further back in the development of the serpent creation, the small rudimentary legs of the python marking an intermediate stage between the Lau and the ordinary snake as we know it.[1]

The common factor in the various accounts given of this creature is that it differs in colour from a python, in the shape of its jaws, in its greater length and girth, and there is no doubt that it is held in the greatest dread by the Nuer. They have a definite name for it, and there seems no particular reason, if this serpent were not distinct from the python, why the Nuer should fear a twelve-foot Lau more than he does a twenty-foot python.

This information soon aroused the curiosity of J. G. Millais, the great British naturalist, who had at this time set about following the Nile to its sources. During his travels he heard of a Sergeant Stephens who was supposed to be firmly convinced that the *lau*, a huge reptile unknown to science, lived in the vast Sudanese marshes. Stephens was an old hunter, and as he was in charge of a considerable stretch of the telegraph line on the east bank of the Nile, his duties gave him many opportunities of living with the negroes and travelling on the river and through the bush. Millais sought him out at Malakal and took down the following statement from him:

The Lau is said to inhabit the great swamps of the Nile valleys from below Malakal to Rejaf and Lake No to Shambe. The natives, whether Shilluk, Dinka or Nuer, have the same name for the great serpent.[2] It is said to be extremely rare and seldom seen by man more than once in a lifetime. Natives who are said to have seen a dead one describe it as forty to one hundred feet long, with a body as big as a donkey or a horse. The colour is said to be brown or dark yellow, and not green and black like the python. On its vicious-looking, snake-like head it has large tentacles, or thick, wiry hairs, with which it reaches out and seizes its victims. If a man sees a Lau first, the creature at once expires, but if the Lau is the first observer the human dies on the spot.

In the time of Bimbashi B. (a well-known telegraph inspector), one Abrahim Mohamed, in the employ of the company, saw a Lau killed near Raub, at a village called Bogga. The man I knew, and closely questioned. He always repeated the same description of the monstrous

[1] On either side of its anus the python has a conical spur which is thought to be the vestige of a leg. Jackson's remark seems to imply, what he has not stated explicitly in the text, that the *lau* has legs.

[2] The python they know as Nyāl [Millais's note].

reptile. More recently one was killed by some Shilluks at Koro-a-ta beyond the Jebel-Zeraf (Addar Swamps). I obtained some of the neck bones of this example from a Shilluk [1] who was wearing them as a charm. These I sent to Deputy-Governor Jackson (now of Dongola province), who in turn sent them to the British Museum for identification, but no satisfactory explanation was given, nor was it suggested what species of snake they might belong to.[2]

Abrahim's story of the size and shape of the great reptile was corroborated by one Rabah Ringbi, a Niam-Niam from the neighbourhood of Wau in the Bahr-el-Ghazal, who had also seen a similar monster killed in some swamps near that place.

Dinkas living at Kilo (a telegraph station on the Zeraf) told me that the Lau frequents the great swamp in the neighbourhood of that station and they occasionally hear its loud booming cry at night.

A short time ago I met a Belgian Administrator at Rejaf. He had just come up from the Congo, and said he was convinced of the existence of the Lau, as he had seen one of these great serpents in a swamp and fired at it several times, but his bullets had no effect. He also stated that the monster made a huge trail in the swamp as it passed into deeper water.

Captain William Hichens has produced an interesting piece of concrete evidence that the negroes know the *lau* well—a carving of a *lau*'s head, a photograph of which he published in *Discovery*. This effigy, which seems to be one of those masks worn in dances over a huge hank of raffia, was carved by Mshengu she Gunda of Iramba, a singer as well as sculptor. In a letter to Frank Lane, Hichens writes:

> Mshengu lived on the south-east side of the Wembare swamps and, as a young man, had travelled and hunted around and over Victoria Nyanza and the Nile swamps. To my suggestion that there was no *lau* he said, "I might have said, as a young man, when I was ignorant, that there is no such thing as a motor car. I had never seen or even heard of one then. But there is your motor car in the sight of my eyes and I have sat on its chairs and heard its bowels digest inside it. It is thus of the *lau*."

I do not see why the *lau* of the Upper Nile marshes and the *lukwata* of Lake Victoria should not be the same animal—or at least animals of the same genus, for the great East African lakes are connected by the Bahr-el-Djebel with the huge marshes around the sources of the Nile.

[1] The Shilluk's name is Bilaltut. The complete skeleton was found in 1914 [Millais's note].

[2] Mr Jackson told me the neck bones were not unusually large, as did also Sergeant Stephens in describing them, so they might have belonged to the ordinary African python [Millais's note].

The fact that relics of both animals are used to make amulets with the same magical properties also agrees with this theory.

It also seems as if the *lau*'s evil reputation, if not its actual area of distribution, stretches to that part of the Belgian Congo nearest to the

104. Wooden carving of the *lau* by a native artist of Iramba. (After a photograph by Captain William Hichens.)

Upper Nile and Uganda, where its description is known, as will be seen from the following story told to my father by a close friend, Colonel Alex Godart, a Belgian hero of the 1914–18 war.

At the beginning of 1912, when he was a lieutenant in the Belgian Congo Police, Godart was going up-river on the Aruwimi in order to set up an outpost, later called Pengé, on the highest navigable point on the river. He had pitched camp in the middle of the virgin forest on the left bank of the river, which in these upper reaches was called the Ituri, when he was surprised to feel a violent earthquake. He was even more surprised when the one soldier who formed his escort rushed off to the riverside with his Albini rifle in his hand.

Some time later the negro came back rather sheepishly and said as if to excuse himself:

"It had already gone back into the water."

"What? What do you mean?" asked Godart.

"The beast [*nyama*] which makes the earth shake when it comes out of the water—it has to be killed, but I didn't see it."

The lieutenant was amused at this charmingly naïve explanation, but he did not want to humiliate the negro, who had shown nothing but courage, so he asked him several questions.

"Is it dangerous? Does it eat men?"

"No, it leaves their bodies. But it kills them, and opens their head to eat the brain."

"Have you ever seen one?"

"I haven't, but my brothers [1] have."

"Oh, and what is it like?"

"It's a very big beast like a hippopotamus, but with a little head with feathers—and a crest like a cock's comb."

The reader will have recognised the "short crest of hair . . . not unlike that of a crowned crane," in the Nuer description of the *lau*. But Godart found this detail so absurd that he had to cut short his interrogation so as not to burst out laughing. All the same, he admired the negro's courage in not only coming with him into country which was then up in arms in revolt, but also in dashing off with only one cartridge in his rifle to attack what he thought was a terrifying monster.

In later years Colonel Godart would tell this story as an instance of the native soldier's courage. When my father told him about my book, the French edition of which had just been published, he saw the story in a new light, and he agreed to write down the conversation which I have here reported word for word. I must point out that Colonel Godart could not have been influenced by the descriptions quoted in my book, because he wrote his note before he had read it. Since then his admiration for the native soldier's courage has increased, and he wishes that he had never laughed at him, even though he only did so inwardly.

Naturally this story does not prove that in the Ituri itself there is a beast related to the *lau* of the Upper Nile and perhaps to the *lukwata* of Lake Victoria. It may just be that echoes of their existence have reached this area. At all events the tradition refers to a fairly heavy and powerful animal if it is to make the earth shake—as elephants, rhinoceroses and hippopotami do—and be popularly credited with seismic earth-tremors. Incidentally only an animal with feet can make the earth vibrate as it moves.

But can we truthfully call these monsters dinosaurs? No, there is nothing in the reports I have so far quoted to justify the name, for while it is often hard to dispute their existence, their various descriptions might variously apply to a stumpy and heavy snake, a giant monitor lizard, an unknown species of crocodile, or even some very odd kind of fish.

It is only the rumours that have come from other parts of Africa over the last fifty years which have gradually suggested the notion that dinosaurs, or rather some dinosaurs with characteristically long necks, may

[1] *I.e.* men of his own tribe.

survive. But we shall see that this shape was arrived at very slowly, usually under the influence of suspect reports and hasty interpretations.

In 1909 a German traveller, Lieutenant Paul Grätz, succeeded in crossing Africa from the Indian Ocean to the mouth of the Congo in a motor-boat. This remarkable feat led him to visit Lake Bangweulu, in Northern Rhodesia, where he noted:

> The crocodile is found only in very isolated specimens in Lake Bangweulu, except in the mouths of the large rivers at the north; but in the swamp lives the *nsanga*, much feared by the natives, a degenerate saurian which one might well confuse with the crocodile, were it not that its skin has no scales and its toes are armed with claws. I did not succeed in shooting a *nsanga*, but on the island of Mbawala, I came by some strips of its skin.

When Hans Schomburgk also crossed Central Africa at the beginning of the century, he was surprised to find when he reached this same Lake Bangweulu that, although this huge lake, 78 miles by 22, seemed an ideal habitat for hippopotami, there was not a trace of one on its banks. When he expressed his astonishment to his native guides, they told him that there was an animal in the lake which killed and ate the hippopotami, although it was smaller than they were. It was an amphibious creature, but apparently it never came ashore, for its footprints were never seen.

When he reached the Dilolo marshes, 500 miles farther west, where the Congo, Northern Rhodesia and Angola meet, Schomburgk heard similar tales about a beast called the *chimpekwe*.

> Unfortunately [wrote Schomburgk in 1910] I thought this story was a fable and did not pursue my inquiries further. Later I talked about it to Carl Hagenbeck, and I am now convinced that it is some kind of saurian. Hagenbeck has received from other sources reports which entirely agree with my own observations and with what I was told by the natives I questioned.

This is confirmed by Hagenbeck himself in his book *Beasts and Men*:

> Some years ago I received reports from two quite distinct sources of the existence of an immense and wholly unknown animal, said to inhabit the interior of Rhodesia. Almost identical stories reached me, firstly, through one of my own travellers, and, secondly, through an English gentleman, who had been shooting big-game in Central Africa.[1] The reports were thus quite independent of each other. The natives, it

[1] These may not have been the only stories: "Mr Sandford of Fort Jameson reports that two trustworthy Europeans have seen a hitherto unknown animal in two little lakes." Hans Schomburgk, *Meine Freunde im Busch*, 1936.

seemed, had told both my informants that in the depths of the great swamps there dwelt a huge monster, half elephant, half dragon. This, however, is not the only evidence for the existence of the animal. It is now several decades ago since Menges,[1] who is, of course, perfectly reliable, heard a precisely similar story from the negroes; and still more remarkable, on the walls of certain caverns in Central Africa there are to be found actual drawings of this strange creature.[2] From what I have heard of the animal, it seems to me that it can only be some kind of dinosaur, seemingly akin to the brontosaurus. As the stories come from so many different sources, and all tend to substantiate each other, I am almost convinced that some such reptile must be still in existence. At great expense, therefore, I sent out an expedition to find the monster, but unfortunately they were compelled to return home without having proved anything, either one way or the other. In the part of Africa where the animal is said to exist, there are enormous swamps, hundreds of square miles in extent, and my travellers were laid with very severe attacks of fever.

Victor Forbin, a French writer and a great adventurer, wrote in 1920 that Hagenbeck was not discouraged by his failure and was always ready to spend fortunes to solve the problem of the African dragon:

> In the winter of 1912 a friend who had long lived in Dar es Salaam (German East Africa) introduced me to a Frenchman who had adopted the tough and dangerous profession of natural history collector, wandering in unexplored areas in search of unknown animals and plants.
>
> He had just come back from the Lake Tanganyika area where he told me he met "amphibious animals, of gigantic size, similar in various respects to the elephant, the rhinoceros and the hippopotamus."
>
> At his request I gave him a letter of introduction to Carl Hagenbeck, the famous Hamburg wild animal dealer, with whom I used to correspond. . . . I learnt later that Hagenbeck had welcomed my animal-collector, and offered him the considerable sum of 100,000 marks for a skin or a skeleton of his mysterious animal, but negotiations broke down, the Frenchman distrusting the German, who tried to extract information from him about the place where he had made his discovery.

On 14 April 1913, the great Carl Hagenbeck, the King of the Zoos, died without succeeding in solving the mystery which had puzzled him for so long.

Fortunately a British settler called J. E. Hughes who had spent eighteen years on the shores of Lake Bangweulu published a book in 1933 in which he gives us more information about a beast which he calls

[1] Joseph Menges, a famous German traveller who collected animals for Hagenbeck.

[2] This confirms what Trader Horn says about the Bushmen's mural paintings.

chipekwe—a remarkably similar name to Schomburgk's *chimpekwe* although Lake Bangweulu is 500 miles from the Dilolo marshes. Hughes made a thorough inquiry among the natives and collected several accounts about it, the most interesting undoubtedly being that of Kanyeshia, son of the paramount chief of the Wa-Ushi. His grandfather had been in at the death of one of these monsters in the deep waters of the Luapula, which, with its tributaries, links Lake Bangweulu to Lake Mweru.

> A good description of the hunt has been handed down by tradition. It took many of the best hunters the whole day spearing it with their large "Viwingo" harpoons—the same as they use to-day for the hippo. It is described as having a smooth dark body, without bristles, and armed with a single smooth white horn fixed like the horn of a rhinoceros, but composed of smooth white ivory, very highly polished. It is a pity they did not keep it, as I would have given them anything they liked for it.

Hughes also heard from H. Croad, a retired magistrate in Northern Rhodesia, some evidence which seemed to confirm the native reports. One evening Croad had pitched his tent beside a small but very deep lake. In the middle of the night he heard a loud splashing noise, and in the morning he found huge footprints of an utterly unknown kind on the bank—he was reputed to be able to recognise all the animals in the area by their tracks. Croad also told Hughes that R. M. Green, who settled on the Lulimala in 1906, was told by the natives of a hippopotamus being killed by a *chipekwe* on the adjoining River Lukulu. Its throat was torn out.

Hughes moreover reports that Robert Young, formerly Native Commissioner for the Chinsali, after whom Lake Young was named, shot at something in this lake: "It dived and went away, leaving a wake like a screw steamer." Young thought that the *chipekwe* still survived there; Hughes himself was more sceptical. He scoured the marshes and offered large rewards, with no result. He therefore came to the conclusion that the *chipekwe* survived until very recently—only a few years ago if Croad's evidence was to be believed—but that it was now extinct. Millais also writes:

> I have met only one practical hunter and man of observation actually believing in the existence of a great beast that is unknown to science. This is Mr. Denis Lyall, who has written many books on the game of Central Africa. He is convinced that there is, or was till recently, some large pachyderm, somewhat similar in habits to the hippopotamus, but possessing a horn on the head, which frequents the great marshes and

lakes of Benguelo, Mweru, and Tanganyika. He calls it a water rhinoceros, and can adduce good evidence for his theory.

I think Lyall and Hughes are being too timid in insisting that this animal is necessarily extinct, when it has been reported so recently. Why should unknown animals suddenly die out as soon as there is good reason for thinking they exist? Probably this timid attitude is a sort of insurance against failing to find the beast. And it is as hard to find an animal in a swamp covering hundreds of square miles in area, even if it is as big as a Diplodocus, as to find a needle in an Everest of hay.

Clearly Lyall's "water rhinoceros" is the same as the *chipekwe*, since it agrees in its habits, size and single horn. It also agrees in its area of distribution, and upon this subject I must also quote from a letter written to Frank Lane by Commander H. C. Maydon, a well-known big-game hunter:

> I met a man, an old hunter-prospector in Livingstone, Rhodesia, who swore that he had seen a water monster in Lake Mweru and had studied its tracks.

Here we must call the evidence of C. G. James, who had lived 18 years in Africa and wrote to the *Daily Mail* during the pseudo-Brontosaurus affair. His letter, which was published on 26 December 1919, was certainly handwritten, for the compositor misread several of the proper names, which I have corrected within square brackets.

> Sir, I should like to record a common native belief in the existence of a creature supposed to inhabit huge swamps on the borders of the Katanga district of the Belgian Congo—the Bangmeolo [Bangweulu], Minero [Mweru], the Kafue swamps. The detailed descriptions of this creature vary, possibly through exaggerations, but they all agree on the following points:
>
> It is named the *Chipekure* [*chipekwe*]; it is of enormous size; it kills hippopotami (there is no evidence to show it eats them, rather the contrary); it inhabits the deep swamps; its spoor (trail) is similar to a hippo's in shape; it is armed with one huge tusk of ivory.

Lake Mweru is connected to Lake Bangweulu by the river-system of the Luapula (where the Wa-Ushi killed their monster) and also to Lake Tanganyika, since the Lualaba runs out of Lake Mweru and is joined by the Lukuga, which runs out of Lake Tanganyika. So there is no reason why we should not find the same animal in all three lakes.

Moreover in the area round the Lualaba, which links Lakes Mweru and Tanganyika, the natives believe in a fairly similar animal. I owe my

information about this beast to Professor Paul Bonnivair, of the Institute of Agronomy at Gembloux in Belgium, who lived in the Belgian Congo from 1910 to 1932, ending his colonial career there as Inspector-General of Agriculture and Forests.

It was soon after the first world war that he learnt of the existence of the *nzefu-loï* from a friend and subordinate called Maurice Vermeersch, who was then an Agricultural Inspector, and knew the Congo well, having been there since 1906. He was particularly familiar with the Baluba tribe, to whom his servant-boys belonged, and with whom he had lived. The African who had been his tracker for six years, and in whom he had perfect trust, gave him the following details about the beast, which he passed on to Bonnivair.

The name *nzefu-loï* meant "water-elephant," but did not necessarily refer to a true elephant of semi-aquatic habits, as the pygmy is supposed to be. Apparently the Baluba of the Kamolondo, called the beast *nzefu-loï* for lack of a better name. According to Vermeersch's tracker, it was an amphibious animal with a body almost as big as a hippopotamus's, but with a very long neck and a hairy tail like a horse's (the negroes thereabouts were quite familiar with the horses at Lusambo and on various farms). It had short and heavy ivory tusks—probably like a walrus's, Professor Bonnivair suggests. I suppose this may be why it is called "water-elephant."

It shared, according to the tracker, the same evil potency that the Nuer attributed to the *lau*, and which is indeed generally alleged of any rarely seen and supposedly dangerous animal in Africa. "When you see it you die." But he added, "All the same, our fathers used to kill the *nzefu-loï* in traps which we have forgotten how to make. They even used to trade in its ivory. One day a Portuguese went off in a canoe to hunt the *nzefu-loï*. He didn't come back."

The *nzefu-loï* used to inhabit the whole of the Kamolondo, the area of lakes on the Lualaba between Bukama and Ankoro. There are more than a dozen lakes between Bukama (9° S.) and Kaniamba (7° 30′ S.); the largest being Upemba with its substantial fisheries, and Kisale, a sea of papyrus similar to the swamps of the Upper Nile, where the *lau* dwells. Today much of the Kamolondo is included in the Upemba National Park.

From the beast's description Bonnivair could not help suggesting that it might be a belated dinosaur of the Brontosaurus type. Certainly with its long neck rising from a pachyderm's massive body, the *nzefu-loï* is very reminiscent of one of these extraordinary Mesozoic reptiles. The

horse's tail should have raised some doubts on this score, but most people are reluctant to abandon the notion of a surviving dinosaur.

Professor Bonnivair suggests that this theory of his, casually put forward in conversation, might have been the remote cause of the Brontosaurus-hunt described at the beginning of this chapter.

> My friend Maurice [he writes to me] went on leave in April 1918, and as we were at war and as he liked South Africa and the Boers so much that he was thinking of settling in the Transvaal, he spent his leave there. Probably he told the above tale in some club or bar adorned with slaughtered antelopes . . . besides true scientists and naturalist-sportsmen there are always braggarts of the Tartarin type. . . . Around 1920, a Johannesburg weekly announced that a British South-African was coming to the Congo to hunt the Brontosaurus in Katanga with dogs specially trained for the purpose (how?) and anti-tank guns!

This must be our old friend Captain Leicester Stevens, but we cannot tell whether Vermeersch, who died at Lomami in 1949, played Lepage's (or Gapelle's) part, or whether he gave someone else the idea of the joke which tempted Captain Stevens to have a crack at being St George.

Examined objectively, none of the trustworthy reports that I have mentioned so far justifies us in using the word "dinosaur." So far the animal has never been a large reptile that stands on its hind-legs or an animal with both a long neck and a long tail, which would be reasons for calling it one. In many cases it is by no means certain that the beast is a reptile: it is more like a mammal. Hagenbeck talks of "a huge monster, half elephant, half dragon," using the word "dragon" in the same sense as the Komodo dragon. Unscientific reasons seem to have caused the elephant half to be deliberately forgotten.

But the negroes cannot have been influenced by semi-digested palaeontology, memories of Conan Doyle's *Lost World* or horror-films. Their evidence is therefore often more valuable, despite their tendency to embroider. As a result of his inquiry about the *lau*, John G. Millais was able to produce one of the only really significant reports about an African animal which might be a sort of dinosaur. It comes from the remains of the Barotse "Empire," on the middle Zambezi between its tributaries the Chobe and Kafue, some 450 miles from Lakes Bangweulu and Mweru, where the *chipekwe* is supposed to live. Schomburgk had heard rumours of a similar animal in Lake Dilolo, the source of one tributary of the Zambezi. The Barotse monster seems at first sight to belong to the same species as the *chipekwe*. Millais writes:

The late King Lewanika, who was much interested in the study of the animals of his kingdom, Barotsiland, frequently heard from his people of some great aquatic reptile, possessing a body larger than that of an elephant, and which lived in the great swamps near his town. He therefore gave strict orders that the next time one was seen he should be told, and he would at once go himself and visit the place. In the following year three men rushed into his court house one day in a great state of excitement, and said they had just seen the monster lying on the edge of the marsh, and that on viewing them it had retreated on its belly, and slid into the deep water. The beast was said to be of colossal size, with legs like a gigantic lizard, and possessing a long neck. It was also said to be taller than a man, and had a head like a snake.

Lewanika at once rode to the spot and saw a large space where the reeds had been flattened down, and a broad path, with water flowing into the recently disturbed mud, made to the water's edge. He described the channel made by the body of the supposed monster to Colonel Hardinge, the British Resident, "as large as a full-sized wagon from which the wheels had been removed."

The Boers' wagons were about 4 feet 6 inches wide. Millais does not say what the Barotse called this beast, but Captain William Hichens made inquiries and found that the natives always called it *isiququmadevu*.

Continuing clockwise around the Belgian Congo, we come to eastern Angola, by following up the Zambezi—the middle reaches of which are haunted by the *isiququmadevu*—towards the Dilolo marshes, where the *chipekwe* lives. It is not surprising to find tales of similar amphibious monsters there.

In 1932 a Swiss scientific expedition set about exploring Angola, its aim being partly zoological. This project was announced in the Lisbon newspapers in the previous December, whereupon A. da Paz Colaça, a former agent of the Diamang, who had lived in this part of Africa for a long time, wrote to the expedition's zoologist, Dr A. Monard, about a problem which had long interested him. He said that in that country there was a large unknown reptile, compared to which "the common croc is a mere baby." He had at first doubted whether the rumours he heard were founded on fact, but little inquiry was needed to convince him that there was something at the bottom of them. In the correspondence that followed he gave so much detailed information that Dr Monard eventually decided to go and see what it was all about. He said that the *libata*, as he called it, was

> amphibious, of huge size, and very voracious; it is extremely rare and is seen only in the Chiumbe area. It is larger, much larger than a crocodile or a hippopotamus; there are none in the Luaximo, but only up in

the Chiumbe and in the Cuilo; it appears only at the beginning of the rainy season or at the end of the *cacimbo* (July, August and September).

Fortunately Dr Monard was one of that fairly rare breed of scientists who keep an open mind:

> The existence [he writes] of a large saurian descended from the reptiles of the Mesozoic era is by no means theoretically impossible. Though every continent has been crossed and recrossed, most travellers follow much the same track, and there are still holes in the net to be explored. There have been several reports that some kind of "Brontosaurus" survives, and several expeditions have even gone to look for it; the fact that they failed may merely prove that this prehistoric beast is very rare or that it lives in country as inaccessible as the great swamps still are.
>
> There are some reasons, based on the history of the continents and of the great reptiles, for thinking that they could survive only in those continents which had already been formed at the end of the Mesozoic era, in Gondwana, which consisted of southern and central Africa, Madagascar, South America (chiefly Brazil), India and Australia. India seems to be too populous and Australia too dry to be included—which leaves Africa and Brazil. While it is not scientific to be too credulous, it is no better to be incredulous; and there is no reason for saying that the survival of some types of Mesozoic saurians is impossible.

In this admirably unprejudiced frame of mind Dr Monard set off into north-eastern Angola with C. E. Thiébaud as his companion, and reached Dala, the Portuguese agent's outpost on the right bank of the Tyihumbwe—or Chiumbe. They camped there three days and then went 10 miles up-river to a village called Tyipukungu, where they pitched camp on the bank of a stream and remained there for four weeks:

> We questioned the *soma* [chief] of Tyipukungu [Dr Monard reports] and all the more intelligent natives; whenever we could we went to the banks of the Tyihumbwe and paddled in the marshes in sun and rain. The *soma* set two natives to watch the river when we could not do so. I went and slept under the stars for three nights 6 miles from the camp at a place where the *lipata* was supposed to live; I put out a small pig as bait, with a bag of strychnine tied to its leg. In fact we did all we possibly could in the hopes of seeing the animal at least; but in vain.

The rains began to threaten, so the two explorers, who had come to their own conclusions, packed their bags and returned the way they had come. Dr Monard was able to establish the following facts about the mysterious animal:

> 1. Its name is *lipata*, and not *libata* as my correspondent wrote. All the natives pronounce it in the same way.

2. It exists only in the upper Tyihumbwe and in the Kasai; I have heard nothing of its presence in the Kuilo.

Around Tyipukungu there are only two, one some 6 miles upstream from the other. Some natives say that there are three, others that there are many. Later we were told that the upstream *lipata* (the one I set the bait for) had left its favourite haunt to settle even further upstream.

3. It is almost always hidden in the water; it does not appear on the surface except in the morning between 9 and 10 o'clock. Others say that you can see it in the evening before the sun goes down. All agree that it is very active when rain falls and that there is the best chance of seeing it then.

It rarely comes out of the water; all the same we were shown some faint tracks made by the *lipata* on a little beach; they were too obliterated for us to make anything of them.

On 1 September 1932 a man from Tyipukungu saw it sleeping on dry land around 9 or 10 a.m.

The women on the Tyihumbwe who are in the habit of fishing on the river have almost all seen it at one time or another. They make a point of shouting before going into the water and this drives the beast away.

As soon as it hears or is aware of man it dives and disappears.

4. It attacks animals of all kinds: goats, pigs, cattle and even men which it swallows in one mouthful. It will also eat crocodiles. The year before (1931), it took an ox and a goat belonging to the natives. This year it had taken nothing so far. Our correspondent knew of its existence in 1927 when he was on the way to Dala; the natives came and asked him for guns to kill it with, for it had just taken one of their cattle.

5. Several *lipatas* have been killed. When the *soma* was a boy (which must have been 40 to 45 years ago), the natives set a trap after a *lipata* had taken three of their cattle. The animal took the bait and was killed.

A white man who had shot a hippopotamus one evening came back in the morning to haul his quarry out of the water. He saw two *lipatas* eating its meat and succeeded in killing one.

6. We showed the natives a drawing of a crocodile; they unhesitatingly called it *lipata*. They called the larger of two other drawings *lipata* and the smaller *ngandu* (crocodile). Of a second pair, one broad and the other narrow, they called the first *lipata*, the second *ngandu*.

The animal is said to be 13 to 20 feet long; like the crocodile it has a serrated ridge of scales along its tail; its mouth is larger, its throat wider and its eyes are closer together on the top of its head—an interesting detail.

One native said that the *lipata* is a *ngandu*; but they all distinguish between the two animals. If you try to find what the difference is, the answer is always the same: *lipata* big, *ngandu* small. They do not seem to know of the existence of young *lipatas*, nor of big crocodiles.

Dr Monard draws the following conclusions:

From all these inquiries my impression is that the *lipata* is merely a crocodile: its habits and its description agree with what we know of

crocodiles. The experiments made with drawings confirm this opinion. There can be no question of a prehistoric animal or fantastic dinosaur. For us the problem is solved. If the *lipata* exists it is a crocodile.

But which? From the Africans' sense of zoology, it may well be that we have two species of crocodile here. Only four species are known in Africa: *Crocodylus vulgaris, C. cataphractus, C. frontatus* and *Osteolaemus tetraspis*. The first is spread all over Ethiopian Africa; the others are rarely found except north of the Congo. The native descriptions are far too vague for one to be able to say for certain which species it is. There are therefore three possibilities:

1. The *lipata* consists merely of large and old specimens of *C. vulgaris* (*niloticus*).

2. The *lipata* is one of the other African species, in a new habitat to the south of its area of ditribution.

3. The *lipata* is an as yet unknown species of crocodile, either related to the known African species, or of an American or Asian genus. It may even belong to a new genus of these large reptiles.

I need hardly say that only an examination of a skin or skull can settle the question.

These conclusions, though based on a thorough inquiry, call for some criticism. The fact that some natives describe the *lipata* as a large *ngandu* does not mean that it must be a true crocodile, for the inhabitants of Flores call the Komodo dragon a "land crocodile." I also think it is going too far to say that "its habits and its description agree with what

105. Outline of the snout of the chief African crocodiles. *Left:* Nilotic crocodile (*Crocodylus niloticus*). *Centre:* West African dwarf crocodile (*Osteolaemus tetraspis*). *Right:* African slender-snouted crocodile (*Crocodylus cataphractus*).

we know of crocodiles." To leave the water but rarely and hunt only at night does not fit in with these far from shy reptiles. Nor should he maintain that it cannot be a "prehistoric animal or fantastic dinosaur." All the crocodiles are prehistoric animals: the existing genera have remained almost unchanged since the beginning of the Tertiary era. The dinosaurs did not all have the Sauropods' familiar long neck and tail. They varied greatly, some resembled the ostrich, kangaroo and rhinoceros in outline. Others, such as the primitive Stegosaurians, especially the Ankylosaurs, actually looked like crocodiles.

Dr Monard cannot, of course, be accused of sceptical bias, but he is not entirely free of prejudice. Perhaps the stories of "Brontosaurus-hunts" mentioned earlier led him to hope that he might discover a reptile of this particular type. When he realised that the *lipata* looked like a common crododile he made up his mind but, I think, somewhat prematurely. The way he abandoned the search for what might be an unknown species of crocodile—or at least a new geographic race of a known species—makes one think he was moved to do so by a fit of disappointment.

If Dr Monard really wanted to find an unusual type of animal in Angola he may have been looking in the wrong place. In the Upper Cuango and Upper Cuanza we shall find detailed rumours about a much more extraordinary creature than the *lipata*. Ilse von Nolde, who spent 10 years in eastern Angola, reported in 1930 that the natives believed that there was an amphibious monster known in Kimbundu as *coje ya menia* or "water-lion." This may be because of the sound of its roar. They often drew her attention to distant rumbling sounds they said were made by this beast, which generally lived in the water but quite often climbed out on to the bank. During the rainy season, when the Cuanza was usually in flood, the *coje ya menia* moved to smaller rivers and swamps, and it was at this time that one had the best chance of seeing one. Thus the Angola "water-lion" roars like the *lukwata* and *lau* of the Nile marshes; it also slaughters all the hippopotami, even though it is smaller than they are, like the *chipekwe* of the sources of the Congo. And like the *nzefu-loï* of the Lualaba it is said to have tusks or large canine teeth which it uses for killing.

One day Frau von Nolde met a native wearing splendid hippopotamus-skin sandals and happened to ask him where he had killed the beast that provided the leather. The native replied at once that he had not killed the hippopotamus himself: he had found it dead, killed by the *coje ya menia*. A Portuguese lorry-driver who ran a service along the

Cuango told Frau von Nolde a strange story. One day on the Cuango around 9° S. latitude he learnt that a *coje ya menia* had chased and killed a hippopotamus the night before. He went off with several native hunters and found the tracks of this chase. For several hours they followed this trail through the savannah. It consisted of the tracks of a hippopotamus that was obviously in a hurry, mixed with unknown tracks smaller than a hippopotamus's, a little like an elephant's but within the circular print there was "the mark of toes beneath the sole of the foot." At last the trackers reached a place where the grass and bushes had been crushed and smashed, and in the middle of this battlefield lay the carcase of a hippopotamus hacked and ripped as if with a huge bush-knife. Nothing had been eaten.

Frau von Nolde stresses the skill with which the natives are able to interpret spoor and the accuracy of their deductions, and adds,

> I have seen negroes crouching over a track, and from grains of sand, crushed grass and animals' footprints, follow every stage of a battle with as much interest as we follow an exciting story at the cinema.

She also insists that the lorry-driver, a perfectly sober man of average education, told her the story quite objectively, concluding,

> There can be no question of confusion with the crocodile, as one might be tempted to suppose. In all the tribes the crocodile is called *gandu* [*ngandu* according to Dr Monard], and the hippopotamus *gufu*.

Crossing the Congo estuary we come full circle in the Cameroons.

In 1913 they were still a German colony, and Kaiser Wilhelm's Government sent out a reconnaissance expedition, the Likuala-Kongo Expedition, to map the country and report on its mineral and vegetable wealth. In charge of the expedition was Freiherr von Stein zu Lausnitz, a captain in the colonial forces. His official report was never published, because Germany lost interest in the Cameroons when she lost the colony itself after the 1914–18 war, but it still exists in manuscript, and Willy Ley has published the passage about "a creature feared very much by the Negroes of certain parts of the territory of the Congo, the lower Ubangi, the Sanga and the Ikelemba rivers." They called the creature *mokéle-mbêmbe*. Captain von Stein points out that his information is based on the accounts of "experienced guides who repeated characteristic features of the story without knowing each other."

> The creature is reported not to live in the smaller rivers like the two Likualas, and in the rivers mentioned only a few individuals are said to exist. At the time of our expedition a specimen was reported from the

non-navigable part of the Sanga River, somewhere between the two rivers Mbaio and Pikunda; unfortunately in a part of the river that could not be explored due to the brusque end of our expedition.[1] We also heard about the alleged animal at the Ssômbo River. The narratives of the natives result in a general description that runs as follows:

The animal is said to be of a brownish-grey colour with a smooth skin, its size approximating that of an elephant; at least that of a hippopotamus. It is said to have a long and very flexible neck and only one tooth but a very long one; *some say it is a horn.* A few spoke about a long muscular tail like that of an alligator. Canoes coming near it are said to be doomed; the animal is said to attack the vessels at once and to kill the crews but without eating the bodies. The creature is said to live in the caves that have been washed out by the river in the clay of its shores at sharp bends. It is said to climb the shore even at daytime in search of food; its diet is said to be entirely vegetable. This feature disagrees with a possible explanation as a myth. The preferred plant was shown to me; it is a kind of liana with large white blossoms, with a milky sap and apple-like fruits.

The information collected by Freiherr von Stein was confirmed in every detail in 1938 by Dr Leo von Boxberger, another German who had been a magistrate in Africa for a long time when Germany still had colonies in that continent. He adds,

My own contribution to the subject is unfortunately very small. At the mouth of the Mbam in Sanaga in Central Cameroons and on the Ntem in Southern Cameroons, I collected a variety of data from the natives about the mysterious water-beast, but, alas, all my notes and also the local description of the animal were lost in Spanish Guinea when the Pangwe attacked the caravan carrying my few belongings. All that I can report is the name *mbokälemuembe* given to the animal in Southern Cameroons. . . .

The belief in a gigantic water-animal, described as a reptile with a long thin neck, exists among the natives throughout the Southern Cameroons, wherever they form part of the Congo basin and also to the west of this area, doubtless wherever the great rivers are broad and deep and are flanked by virgin forest.

Ivan T. Sanderson writes to me that in 1932 he came upon "vast hippo-like tracks" on the Upper Cross River above Mamfe Pool, where there were no hippos because this creature—whose name he transcribes from Anyang as *mbulu-eM'bembe*—drove them away. Some months later,

Gerald Russell and I with two boys in two small canoes entered this river from below through a gorge into the Mamfe Pool at dusk, as we passed some all-but-submerged caves in the cliffside, got the shock of

[1] This refers to the outbreak of the World War [Ley's note].

our lives when the most terrific noises I have heard outside of warfare issued from one of the said caves and *something* (and it was the top of a head we both feel sure) much larger than a hippo rose out of the water for a moment, set up a large wave and then gurgled under.

In the northern Cameroons the natives also fear a water-monster, which, though it seems very different from the *mbokälemuembe* or *mokéle-mbêmbe*, is reminiscent in name at least of the *coje ya menia* or "water-lion" of eastern Angola. This is told by another German colonial called Naumann of Ulm, who once belonged to the German Imperial Defence Corps in the Cameroons:

> In the New Cameroons, which we had retaken from the French in 1912, I was in the Kaja territory north of the Uam which runs into Lake Chad. The Kaja who live among the granite rocks were astonished to see me ride a horse. They had never seen one. This is what they told my interpreter:
>
> In their country there was also a big beast with a large mane which lived in the water. The animal was very dangerous, it was a much feared wild beast. It was only very rarely seen. Its name in the Baya language was *dilaï*, or "water-lion."
>
> Although I promised a reward of 50 marks, no one was able to show me this animal. In another area they were called "water-leopards." In the Foulbé language there was also a name for them.

I have had independent confirmation of this information, and also had it much completed by Lucien Blancou, formerly Chief Game Inspector in French Equatorial Africa, one of the greatest experts on the fauna of this area; moreover he has helped to tidy up the confusion a little. "Throughout the Ubangi-Shari," he writes, "there are traditions and tales concerning at least two hitherto unknown animals." One is what the Baya call *dilali* (and not *dilaï*)—which in fact does mean "water-lion"—the Banda *mourou-ngou* ("water-panther") and the Youlou *gassingrâm*. It is a wild beast generally described as aquatic, except by the Youlou, who live in mountainous country. "The *dilali*," remarks Blancou, "is supposed to have been looked for in vain by a German lieutenant when this country was occupied by the Germans from 1912 to 1914." More than likely this is our Naumann of Ulm.

The other unknown animal is called *diba* by the Baya, *badigui* by the Banda, who also call it *ngakoula-ngou* (water-devil) in another dialect, and *songo* by the Banziri. It is said to be a sort of huge snake which occasionally strangles hippopotami but does not eat them.

Let us see what Blancou can tell us about the first of these mysterious water-beasts. On 26 May 1930, when he belonged to the Civil Service

of French Equatorial Africa, he had shot his first hippopotamus in the little River Mbari, a tributary of the Ouaka in the north of the Ippy subdivision. This happened in the heart of Ubangi-Shari, deep in the bush, several days' march from the nearest villages.

> The animal still had not floated at nightfall, so we camped near by until the following day waiting for the carcase to come to the surface. During the night there was a high wind and small rain. At dawn the porters and trackers told me that they had heard a *mourou-ngou* calling near the dead hippo. When the beast had been dragged ashore I saw that there were signs that the carcase had been bitten, apparently by crocodiles. But all my men knew crocodiles well. Unfortunately they had not thought it necessary to wake me so that I could hear the "water-panther's" cry.

Blancou's curiosity was aroused and he lost no chance of finding out more about the mysterious beast, elsewhere known as the "water-lion." In 1932 at Bozoum in eastern Ubangi-Shari an interpreter called Ghazi said that the *dilali*—though he had not seen it himself—had a horse's body and a lion's claws. A native guard of Zandé origin who was present during the conversation added that it had large tusks like a walrus's. He maintained that it ate fish, though the Baya said it ate nothing but leaves, and it was shown not to be a carnivore by an old chief's story that they had found a hippo and a crocodile, some two miles from the river, which had been bitten by the *dilali* but were otherwise intact.

When Blancou was at Ndélé in central Ubangi-Shari in 1934 a Banda guard called Abdoulaye told him that the *mourou-ngou* even killed elephants, especially on the Iomba River. He was told this again, four years later, by another African guard: according to certain negroes in the south of Ndélé there was a *mourou-ngou* at the source of the River Bamingui (one of the main branches of the eastern Shari). It killed elephants and dragged them to a cave in the middle of the forest.

It was also in 1934 that the old interpreter and veteran rifleman, Moussa VII, brought a Morouba Banda tribesman, about 60 years old and also called Moussa, to see Blancou. This old man told a story which Blancou relates as follows:

> In 1911 (this date has been cross-checked) when he was porter with a detachment of riflemen going from Fort Crampel to Ndélé, Moussa saw one of these soldiers seized by a *mourou-ngou* at the junction of the Bamingui and the Koukourou. The animal was shaped like a panther, a little larger than a lion but with stripes, and about 12 feet long. The background of its coat was likewise the colour of a panther's, but its footprint was oddly described as containing a circle in the middle (?).

The soldier was in a canoe when the animal came out of the Koukourou "like a hippo," just where the rivers met, seized the man in the canoe and dragged him into the water capsizing the boat, surfaced once more with the soldier in its mouth and then disappeared. The man paddling the canoe swam safely away, but the soldier's rifle and kit remained on the bottom of the river. After this drama the detachment decided not to cross the river there but went some three days' march farther east before doing so.

Moussa told me that he never saw the *mourou-ngou* nor its footprints again. He had found them some time before, in almost the same place, when he was driving Sultan Snoussi's cattle to Fort Crampel. They were beside the Koukourou, and larger than a lion's. Moussa had never heard this animal cry, nor had he heard tell of its cry. This seems to have happened in the middle of the rainy season, in August or thereabouts.

This story struck me at once, because I had just been checking the records of the outpost at Ndélé and found signs that a rifleman had been lost about this time.

In 1936 Blancou was told at Fort Crampel in central Ubangi-Shari that the *mourou-ngou* had carried off men from a village called Dogolomandji into the River Gribingui without leaving a trace, and that this had persuaded a party of villagers to move away from the river. The Banda in this area had never seen the "water-panther," and so could not describe it, but they could tell it was not a crocodile because it left no remains of its victims.

About a decade later, in 1945, the same Game-Inspector's gunbearer, called Mitikata, drew the following sketch of the *mourou-ngou* for him. It was about 8 feet long. It had a small head, fangs like a lion's, a plump body which was brownish above and below, and a panther's tail. It lived in the water all the time, raising its head above the waves only in the evening, and killed men by dragging them into deep water. Mitikata added that he had never seen a "water-panther" himself but old men had described it to him. It was supposed to live in the Ouaka and Kotto rivers.

In 1937 the village chief of Ouanda-Djalé, in eastern Ubangi-Shari, told Blancou about a mysterious beast called *gassingrâm* which haunted the district. He said it was larger than a lion and reddish-brown all over. Moreover its footprints were larger. It had been seen abroad in the daytime, thought very rarely, carrying off its prey to caves in the mountains. At night its eyes shone like lamps.

Blancou thinks this animal is the same as the *dilali* and the *mourou-ngou* because they are all described as large cats, but it seems to me that the striking difference in habitat confutes this view. To introduce a land animal into this chapter of amphibious monsters can only confuse it

even more, and God knows it is confused enough already by animals very different from one another.

Let us proceed to the second unknown animal in the Ubangi-Shari, the snake-like *badigui*, also known as *ngakoula-ngou*.

In 1930 or thereabouts it was described to Lucien Blancou by the Linda Banda of Ippy as a gigantic snake that killed hippos without leaving any sign of a wound and browsed on branches of trees without leaving the water. This would of course be a very odd diet for a snake, which in any case would not be able to lift its head out of the water unless it was resting on the bottom, so one may well suspect that there might be a bulkier body behind the snake-like head and neck. Like the *isiqugumadevu* and the *mokéle-mbêmbe*, it really does remind one of a dinosaur.

The chief of the Yetomane division, a great hunter thoroughly at home in the bush, and other Linda Banda told Blancou that a year before he took over his post, that is to say in 1928, one of these animals had crushed a field of manioc belonging to the chief and had left tracks between 3 and 5 feet wide. The same beast was said to have killed a hippopotamus at about the same time in the River Brouchouchou near Chief Mapouka's village. The villagers had no qualms about eating the "water-devil's" prey.

The Baya gave Blancou a similar description of the monster, which they called *diba*, at Bozoum in 1932, and so did a young Banziri secretary, who said that it was traditionally called *songo*. In 1934 he learnt more precise and definite details about the beast from old Moussa, whose information about the *mourou-ngou* has already been quoted. Indeed the reason why the old man was brought to see the white man who was interested in animals was because he was known as "the-man-who-had-seen-the-*badigui*."

> When he was about 14 years old [Lucien Blancou relates], and the Whites had not yet come (about 1890, I suppose), Moussa was out laying fish-traps with his father in the Kibi stream, which runs into a tributary of the Ouaka called the Gounda in what is now the Bakala district. It was one o'clock in the afternoon in the middle of the rainy season. Suddenly Moussa saw the *badigui* eating the large leaves of a *roro*, a tree which growns in forest-galleries. Its head was flat and a bit larger than a python's (Moussa spread his hands and put them together to show me the size). Its neck was as thick as a man's thigh and about 25 feet long,[1] much longer than a giraffe's; it had no hair, but was as smooth as

[1] This figure is, of course, Blancou's, based on Moussa's indications; "much longer than a giraffe's" is a more valuable yardstick. Now a giraffe's neck is 7 or

a snake, with similar but larger markings. The underneath of its neck was lighter—also like a snake's. Moussa did not see its body.

His father told him to follow him and run away. The animal gave no cry, but Moussa said that he had heard its cry at other times when he had not seen the beast himself. He did not imitate it for me.

According to him, the old men believed the *badigui* was dangerous, but he had never heard of anyone else meeting one. He had seen its tracks out of the water, but only on the bank, and they were as broad as a python's. Finally he said that the *badigui* does not frequent places where you find hippopotami, for it kills them.

In 1945 Mitikata, Lucien Blancou's gun-bearer, whom I have already mentioned, told him about the *ngakoula-ngou*, saying that it was a huge snake which left tracks as broad as a lorry. He said he had seen one of these tracks 15 years before, near the outpost at Ndélé, but not the animal itself.

I should add [remarks Blancou], that the Africans in these parts kill hundreds of pythons of all sizes every year, so they know them perfectly well.

So much for the reports. Do they all refer to the same animal? Hardly. In fact there is only one respect in which all agree. They are all amphibious. Indeed, this has been my criterion in including them in this chapter. They are also not so very different in size. The *lukwata* is the size of a small porpoise or a large manatee, the *dingonek*'s back is as broad as a hippo, the *lau* is as thick as a donkey or horse, the *chipekwe* and the *coje ya menia* a little smaller than a hippo, the *mokéle-mbêmbe*, the *nzefu-loi* and the "beast-that-makes-the-earth-shake" as big as a hippo, the *isiququmadevu* and the *lipata* bigger than a hippo, and the *mourou-ngou* bigger than a lion—the differences are not great—no more than might be due to the animal's age and sex and the narrator's degree of exaggeration. Where figures are given the only real discrepancy is in the size of the *lau*. The negroes' estimates varied between 40 and 100 feet. As they were all referring to the same carcase, someone must obviously have been exaggerating considerably, especially as Jackson says the *lau* is usually smaller than the python. Old Moussa's reckoning that the *badigui*'s neck alone was 25 feet long, may well be a mistake, as I have suggested above. Moreover half a century had passed since he

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8 feet long. If the *badigui*'s neck was really 25 or even 15 feet long Moussa would surely have said "two or three times as long as a giraffe's." I think a length of 10 or 12 feet is a reasonable interpretation of Moussa's evidence.

saw the beast, and it is common knowledge that dimensions increase with time.

We can therefore say that all the reports refer to an amphibious animal with a body roughly as thick as a hippopotamus's—rather less according to most of them. This has led some authors into thinking all the animals are the same. Yet in other respects they are very different. Here are some of the more glaring discrepancies:

The skin is sometimes said to be covered with scales, sometimes bare or smooth. In some the neck is short; in others it is long, even very long and flexible. The tail is at one time compared to a crocodile's, at another to a horse's or to a panther's. Finally it is surprising to find that some have tusks or fangs like a walrus's, while others have a little horn on the nose and one even has a crest and barbels. While these features do not mutually exclude one another, they are too conspicuous to have been noticed in some animals and not in others. They might all of them be features peculiar to the male as a result of sexual dimorphism; but it is most unusual to find a female with a feature absent in the male. For instance, it is hard to imagine a species in which only the male had large tusks and only the female had a horn on the nose. Nature is not chivalrous, the males get all the finery.

In short, the various descriptions of African "dragons" obviously refer to at least three quite different types of animal—so it is not surprising that a mixture of these creatures has produced an absurd and fantastic beast, which it is difficult to believe in, let alone identify.

The thorough inquiry that Lucien Blancou was able to make when he was game-warden in French Equatorial Africa has shown that in a particular area the natives believe in two distinct amphibious animals, both unknown to science. One is a beast of prey, with large fangs and hooked claws, which swallows its victims leaving nothing behind, the other is a long-necked vegetarian which kills hippos but does not eat them.

Two more different animals can hardly be imagined, yet even among the natives there is some confusion between the two, doubtless because they are so rare and because their names, which are similar, have been misunderstood. Thus the Baya, who say that the *dilali* or "water-lion" has a horse's body and a lion's claws, claim that it eats nothing but leaves. A Zandé who was present when this information was elicited believed that it had large tusks and lived on fish. The name *dilali* therefore seems to have been applied to two different animals.

The converse is equally true. Blancou, like Naumann, thought that

different peoples used the names, "water-panther" and "water-lion" to describe the same animal; but the first is supposed to leave no scrap of the elephants and men it attacks, which hardly agrees with the second being supposedly a vegetarian.

Sometimes known animals have similar names, which only confuses descriptions which are vague enough already. Thus the Banda do not use the term *mourou-ngou* (water-panther) only for a savage monster; it is likewise the name for the giant water-shrew (*Potamogale velox*), which is also called *kovoro*. This animal is a giant for an insectivore, but it is barely 2 feet long and feeds chiefly on fresh-water snails, clams, frogs and fish. Moreover the panther itself may have added to the legend of the *mourou-ngou*: for it is not afraid of water, swims well and catches fish in shallow water.

The whole question is extremely muddled, and if we are to make any sense of it we must try to eliminate the various animals which have no business here.

Let us deal first with the animals which seem to have short necks: the *dingonek* (or *ol-umaina*) of Kenya, Lieutenant Grätz's "degenerate saurian," the *nsanga* of Lake Bangweulu, and the voracious *lipata* which Dr Monard searched for in Angola. The *mourou-ngou* with its spots and projecting fangs is probably similar to the *dingonek* and should therefore be included in this first group.

Now all these are rather heavily-built quadrupeds, between 12 and 16 feet long, reminiscent in shape of a crocodile, giant lizard or theoretically even an ultra-gigantic otter.

There seems little doubt that the *lipata* is some kind of crocodile: the saw-like ridge of scales on the tail, and particularly the eyes close together on the top of the head, are very characteristic.

One cannot be so positive about the others, though the *dingonek* or *ol-umaina* has several of a crocodile's features. It is covered with conspicuous scales and has a broad, long tail. It is spotted like a leopard, as crocodiles not infrequently are. But only with a great deal of exaggeration can a crocodile's largest teeth, like canines, be compared to a walrus's tusks. Moreover, the *dingonek*'s head has been compared to an otter's, a dog's and lioness's, and this hardly agrees with the Nile crocodile's characteristically long skull and jaws. And what are we to make of the sort of ears it is alleged to have, which may be like the horns of a horned viper?

It is only among prehistoric reptiles that we find true tusks. Without

going so far as to maintain that it must be one of them, we can safely say that the *dingonek* belongs to a very special genus. In the jungle rivers of West Africa there lives the little black crocodile (*Osteolaemus*), which differs from the other African crocodiles, all of which belong to the genus *Crocodylus*, in being darker, smaller (not much over 6 feet long), and especially in having a shorter rounder head like a cayman's. Perhaps, unknown to us, there may be a giant species, slightly larger than the Nile crocodile, and doubtless on the road to extinction. If small colonies of such a species survived in Kenya, Ubangi-Shari and Angola, it might explain the legends of the *dingonek* (or *ol-umaina*), the *mouroungou* and the *lipata*.

The *nsanga* alone of this first group cannot possibly be classed among the crocodiles, from which it differs in its smooth skin and in having claws; for, while the crocodiles do have claws, they are short and more like nails, and cannot be compared with the hooked claws on some toes of most lizards. As lizards' scales are sometimes so small and inconspicuous that the skin seems smooth, it is more than likely that the *nsanga* is a large lizard. A smooth-skinned crocodile with claws reminds one irresistibly of a giant monitor like the Komodo dragon.

As the monitors have fairly long necks—at all events longer and more flexible than those of crocodiles—the *nsanga* will serve as a link with the next group of African "dragons," those which, in part at least, are shaped like snakes: the *lau* of the Upper Nile swamps, the *nzefu-loï* of southern Belgian Congo, the *isiququmadevu* of the Upper Zambezi, the *mokélembêmbe* of the Cameroons and the *badigui* of Ubangi-Shari.

We can set the *lau* quite apart from the rest of this group, from all of which it differs in so many peculiar features that its identity seems to me quite transparent. It is described as a thick, short water-snake, with a crest of "hair" and barbels on its head; it makes a loud, rumbling noise, comes out of the water and leaves a broad track on land and lives in holes burrowed in the banks.

Apart from the beast's size, this description perfectly fits a fish of the catfish family (Siluridae), of which there are many species in all the muddy waters of tropical Africa. The catfishes may be recognised by the long barbels around the very wide mouth, some of which sprout from the nose itself. Some catfishes have a dorsal fin which might be mistaken for a crest. They all tend to have long bodies, the extreme being *Gymnallabes* and *Channallabes*, which have no pelvic or pectoral fins and look exactly like eels—or snakes. Those of the genera *Clarias* and *Heterobranchus* have complex organs inside their gill-cavities,

thus allowing them to breathe air on the surface. At night they come out of the water and crawl on land in search of animal food. *Clarias lazera* of the Sudan even spends the dry season in burrows, from which it also emerges on the prowl at night. And *Eutropius* has long air-sacs as further aid to respiration. Although they have no vocal cords, these fish can still make a growling noise which can be heard a long way off. Finally, in front of some of their fins, certain catfishes have poisonous spines which can cause appalling wounds, and there is one, the electric catfish (*Malopterurus*), called *raad* or "thunder-fish" by

106. African catfish of the genus *Clarias*.

the Arabs, which produces violent electric shocks. It is hardly surprising that such fish should be much feared and surrounded with all sorts of superstitions. Indeed, it would be natural enough if it was eventually believed that you could be thunderstruck if some of them so much as looked at you.

There remains the *lau*'s alleged size. In Africa none of the known catfishes is very large: the electric catfish is the biggest at 5 feet long. But the giant catfish or wels of European rivers is sometimes more than 10 feet long and weighs more than 400 pounds. Professor Osmond P. Breland writes with his usual caution: "This fish is said to attain a length of fifteen feet and a weight of over 700 pounds, but I have not

been able to confirm these figures." It seems to be the largest known freshwater fish. It is enormously voracious, attacking not only other fish, but also small land animals like birds and mammals.

Thus it would not be so strange if there were an unknown and perhaps formidable giant catfish in Africa. My friend André Capart, Assistant Director of the Laboratory of the Belgian Royal Institute of Natural History, who led the Lakes Kivu, Edward and Albert Expedition in 1953–4, tells me that they discovered a large unknown catfish (genus *Heterobranchus*) about 3 feet long in Lake Edward. The native fishermen used to believe it was an evil spirit called *giricho*, and that to catch it or even to see it brought bad luck. Naturally nobody took any notice of them.

The *lukwata* of Lake Victoria, which Sir Harry Johnston thought was "more probably a gigantic fish," is also very likely a huge catfish. Sir Clement Hill, who saw one, said that it had a rounded, fish-like head. The head of a catfish 4 feet long may be as much as 16 inches wide, so it is easy to see how terrifying the gaping maw of a similar fish would be if it were two or three times the size.

The *nzefu-loï* or "water-elephant" is a particularly thorny question, but it may give a clue to part of the problem. Since it is alleged to have a hairy tail like a horse's, it cannot very well be a reptile. But why on earth *should* it be one? The reference to a "very long neck" has suggested the notion of some sort of Brontosaurus. May it not really be an elephant, as its name implies, one of those little "water-elephants" that I have already discussed? The "water-elephant's" neck is longer than that of the ordinary elephants, and it certainly has hair like horsehair on its tail, as all the elephants do. Moreover, may not the tales of amphibious monsters as much like an elephant as a hippopotamus or "half-elephant, half-dragon" be founded on the same kind of animal?

Here it may help if I quote the first circumstantial account ever published about elephants of aquatic habits. We owe it to one Le Petit; and I have referred to a summary version of it on page 363. He also gave a British naturalist called R. J. Cuninghame a much more detailed report about them. During the five years he spent travelling in the French and Belgian Congo, Le Petit twice saw water-elephants. The first time was in 1907, and they were swimming in the Congo River near its junction with the Kasai. He saw them a second time in the swampy area between Lake Tumba and Lake Leopold II, "near to where the M'fini River finds its exit from Lake Leopold II."

On the second occasion [Cuninghame reports], he saw five of these animals on land and was able to look at them for fully one minute through his glasses and, as they were in tall grass 400 yards distant, he had a good opportunity to observe. He took a shot at one of them and hit it in the shoulder, but though he offered the natives an ample reward they never were able to recover it.

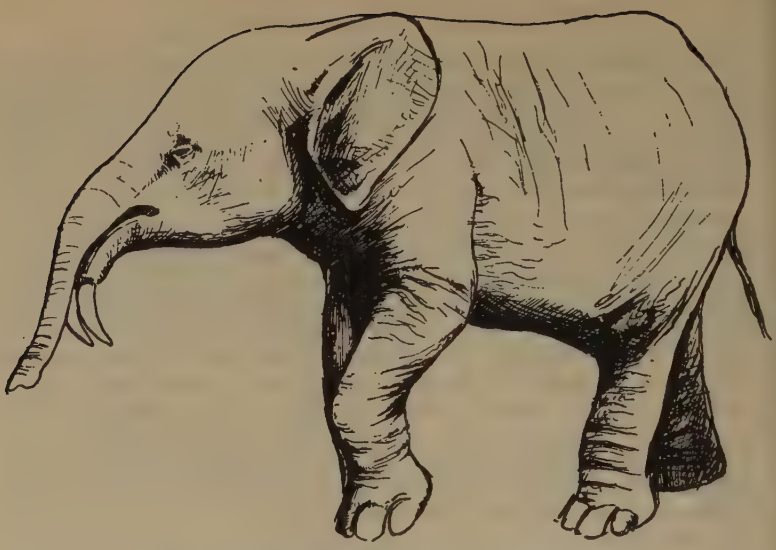
Height at shoulder, 6 to 8 feet. Legs relatively short. Back curved as in *E. africanus*. Tail not observed. Neck *about* twice the length of *E. africanus* with ears similar in shape to those of that species, but relatively smaller. Head most distinctly long and ovoid in form, with trunk only about 2 feet in length. The shape of the feet was seen in the spoor on sand and showed four toes distinctly separated as in the hippopotamus, but the weight of the body seemed to be carried by the toes largely, while the plantar impression of the sole was not very pronounced. The ground was level where this spoor was seen. All the animals observed had no traces of tusks. Skin is apparently hairless, smooth and shiny resembling that of a hippopotamus, only darker. The gait was elephantine, and the last seen of those five water-elephants was their disappearance into the water, which was deep.

In habit they are nocturnal, coming out to feed on strong rank grass after sundown. They spend the day in the water much as hippopotami do. The Babumas (fishing natives) know this animal well and have a name for it, 'Ndgoko na Maiji', meaning the water-elephant, and they fear it greatly as it is known to rise from the water and with its short trunk capsize canoes. It is also very destructive to the nets and reed fishtraps of the natives. Its locality is apparently very restricted, and the natives maintain they are not very numerous.

Cuninghame goes on to remark that the primitive forms of the Proboscidea had a "long-shaped, ovoid type of skull" like modern tapirs and that "the cervical vertebrae were antero-posteriorly much longer than is now the case in modern elephants." He concludes: "These two characteristics are very marked in the water-elephants, and M. Le Petit is most emphatic that the heads reminded him more of enormous tapirs than of any other existing animal."

Le Petit's strange Proboscidea are so much more like certain primitive and supposedly-extinct elephants than any modern species that one cannot help wondering whether the pygmy elephants so far reported, Lieutenant Franssen's, for instance, really belong to the same species. None of the published photographs and descriptions showed the odd features noticed by Le Petit, the short trunk, long neck and thinner toes.

Some fossil elephants have survived until very recently in Africa, where they were certainly contemporary with man. The huge Dinotherium, with tusks curving downwards like a walrus's, was one of them. The largest species (*D. giganteum*) was 16 feet high at the shoulder. The



107. Reconstruction of the Dinotherium.

remains of a smaller species (*D. hopwoodi*) have been excavated from Pleistocene deposits not more than 100,000 years old in Kenya and Tanganyika.

At the end of the last century some zoologists refused to admit that the Dinotherium was quite extinct. Might not a small aquatic species still survive in the swampy areas of the Congo basin? Nor is the *nzefu-loi* the only "dragon" in the upper reaches of a tributary of the Congo which might be a sort of elephant. Frau von Nolde says of the usual description of the *coje ya menia* or "water-lion" of the Upper Cuango that it "always seems to apply to some pachyderm armed with powerful teeth which it uses as weapons," and the animal's tracks were described to her as like an elephant's with "the mark of toes beneath the sole of the foot." And according to the Zandé I have already quoted, the *dilali* or "water-lion" of the Upper Ubangi had tusks like a walrus's.

All these "water-lions"—a name which may be an allusion to their ferocity, power or sovereignty over other beasts—are supposed to kill hippopotami, but not to eat them. It would not be at all surprising to find a water-elephant behaving in this way. The hippopotami would occupy the same habitat and claim the same territory and vegetable food, so they would be particular enemies. It is easy to see how the water-elephant might chase a hippopotamus ashore, stabbing savagely with its tusks, and eventually leave it in the state in which the beast was

found that had been so appallingly lacerated by a *coje ya menia*. This is certainly the way a Dinotherium would fight, with its tusks pointing down like a walrus's or a sabre-toothed tiger's canines.

Now that we have eliminated a short-nosed crocodile, a giant catfish and water-elephant (which nonetheless deserve attention from the zoologists), the African dragon's dossier still contains the legends and reports about large amphibious animals with very long necks, called *mokéle-mbêmbe* (or *mbokälemuembe*) and *badigui* to the north of the Belgian Congo and *isiqugumadevu* (perhaps also *chipekwe* and *nsanga*) to the south of that country. They are the kernel of the problem. They alone are relevant to any discussion of the possible survival of a dinosaur in Africa.

First let us consider the *nsanga* and *chipekwe*, which can be included in the long-necked group only on the slenderest evidence.

Lieutenant Paul Grätz spoke of a "degenerate saurian" in Lake Bangweulu. It was a sort of smooth-skinned crocodile with curved claws called *nsanga*. Meanwhile Schomburgk, C. G. James and J. E. Hughes said that an animal called *chipekwe* lived there. It also had smooth skin, but bore a single ivory horn on its forehead. Of course it is quite usual for the same animal to have several names in different dialects, or even in the same dialect. But we do not know enough about the appearance and habits of the *nsanga* and *chipekwe* to say for certain that they are the same.

The *nsanga*, as I have already mentioned, might be a large monitor lizard. Now, although the monitors may be compared to crocodiles in

108. Australian monitor lizard, showing its conspicuously long neck.

general shape, they have a relatively long and slender neck, especially in certain species. This and the apparently smooth skin are strictly speaking the only features in which the *nsanga*, if it is a monitor, resembles the *mokéle-mbêmbe* and the rest.

The *chipekwe* also seems to have several points in common with them. Not only is its skin smooth, but it has the odd reputation of killing hippos but not eating them. Only Schomburgk reports that it devours them, but this may be his own opinion, since all the other legends and reports unanimously contradict it. The *chipekwe* and *mokéle-mbêmbe* are, moreover, linked by a secondary anatomical feature: the single horn which they both have on the nose.

Yet if the *chipekwe* really belongs with the *mokéle-mbêmbe*, *isiququmadevu* and *badigui*, it is odd that no one has mentioned that it has a long neck. Perhaps their necks may not be so conspicuously long after all.

The *isiququmadevu*'s "long neck" and the *mokéle-mbêmbe*'s "long and very flexible neck" might indeed be only relatively long, like a monitor's compared with a crocodile's. A giant monitor whose body was 8 feet long from shoulder to rump would have a neck half that length—that is, 4 feet. But in this case how are we to explain old Moussa's description of the *badigui*? A neck longer than a giraffe's, that is to say 10 or 12 feet long at least, could hardly be said to be *relatively* long. And it is certainly not a feature that could be overlooked, especially if it was as thick as a man's thigh.

In short, we must isolate one or the other from the long-necked group: the *chipekwe* because its neck seems too short or the *badigui* because its neck is too long. The *chipekwe* is the better choice, as all the others have more points in common. But it need only be provisionally isolated; if it is shown in the future that the *chipekwe* also has a long neck, but our authorities have merely omitted to mention the fact, then its quarantine will be over. Actually we know so little about this animal's appearance that it is impossible to say what it may be. Denis Lyall may have had good reasons for calling it a "water-rhinoceros," so may Schomburgk for thinking it was "a sort of saurian," but neither of them has told us what they were.

So let us concentrate on the *mokéle-mbêmbe*, *badigui* and *isiququmadevu*. The *badigui* is the least known of the three, but it may well be identical with the *mokéle-mbêmbe*, since they both have a snake's head, a long neck and smooth skin. Moreover they both eat leaves, and though they attack and kill anything which annoys them, whether it be hippopotami or men in canoes, they do not eat them. They also live

in neighbouring areas, the Ubangi-Shari and the Cameroons, both watered by tributaries of the Ubangi.

The *mokéle-mbêmbe* and *isiqugumadevu* are no less alike, though one lives in the Cameroons and the other in Northern Rhodesia, at least 1,200 miles apart. They both have a body almost the size of an elephant's, a long neck and long powerful tail like a crocodile's or a lizard's. The *isiqugumadevu* has a snake's head, and both it and the *badigui* leave a track about 5 feet wide. The *isiqugumadevu* is the only one of the three whose legs have been described: they are said to be like a lizard's. No doubt this means that they are rather to the side of the body, with the knees and elbows well away from it. This would seem to be confirmed by the evidence that the beast sometimes slides on its belly with its feet off the ground.

The *mokéle-mbêmbe*'s skin is said to be brownish-grey. The *badigui*'s, on the neck at least, is marked with pattern like a python's but bigger. The only adornment on the three is the *mokéle-mbêmbe*'s single tooth, which is presumably a horn. It may well be an inconspicuous bump or a feature peculiar to the male, and might thus have been missed by some of the witnesses.

We now have a fairly detailed picture of the African "dragon," provided we assume as a working hypothesis that the three amphibious animals are of the same kind. This is reasonable enough, for while the various information we have about them is sometimes complementary, it is never contradictory. This gives us a picture of a large quadruped with a small, rather triangular head adorned with a little inconspicuous horn on the end, a long and flexible neck, a thick thorax a little bigger than a hippopotamus's, legs on the sides of its body and a long and powerful tail. Its skin is smooth, brownish-grey and marked with a large dark pattern. From the bulk of its body let us say that it is roughly 25 to 28 feet long or even more than 30 feet if its tail tapers very gradually.

It is amphibious and spends most of its time in the water, making its lair in a hole in the bank. It also ventures on land in search of its food, which is basically vegetable. Although it is not carnivorous, its territorial instinct impels it to kill its rivals the hippopotamus and probably the manatee too. No doubt the same instinct impels it to capsize canoes stupidly mistaking them for rivals too.

What, then, is its zoological identity? The first step is to assume that it is a reptile. But it need not necessarily be one. Denis Lyall thought

the *chipekwe* was a sort of aquatic rhinoceros and he may be right in this case, but a long-necked monster, even if it has a horn on its nose like the *mokéle-mbêmbe*, can obviously not be a rhinoceros. Moreover an animal may look like a rhinoceros without being one. In North America there were once horned dinosaurs, the Ceratopsia, which looked like early versions of a rhinoceros. A Swiss scientist, Dr Martin Wilfarth, has attempted to show that the African "dragon" may be a single-horned Ceratopsian called the Monoclonius. This theory could apply only to the *chipekwe*, and it still remains to be proved that any of the Ceratopsia ever lived in Africa.

Other scientists, feeling that surviving dinosaurs are too strong meat, have recalled that there were once large herbivorous mammals with fairly long necks and formidable claws, which were probably amphibious into the bargain, and that the "dragon" might be one of them. As Hichens remarks, "According to some it may be a *Chalicotherium*, that remarkable beast from the end of the Miocene which had a horse's head, feet with toes, and looked like a cross between a horse and a sloth."

Some of the Chalicotheria survived in Africa until the Pleistocene, so this is not too daring a theory. But the likeness is only partial, for the beast lacks the long tail and legs sticking out from the sides of the body. Moreover, it has been shown that the Chalicotheria were not amphibious, as was at first thought. One of them would make a much better Nandi bear than a "water-dragon."

No doubt it is the "dragon's" smooth skin that has led people to think it is a mammal rather than a reptile. But some living lizards have such small close scales that the skin merely seems to have a very fine grain; and there is no reason why large aquatic reptiles should not have lost their scaly skin. Moreover, those who have seen the beast, while comparing it in size to an elephant or a hippopotamus, generally describe it as a snake, a lizard or a crocodile. A reptile's stiff, jerky and hesitant movements can be told at first glance from the more graceful and continuous action of a mammal.

Assuming it is a reptile, what kind is it? In outline it is certainly like a dinosaur; that one can hardly deny. But it could be a giant species of monitor. These reptiles are found in all the hot countries in the Old World. The Australian monitor has a relatively long and slender neck; its cousin, the Komodo dragon, stands upon very substantial legs; and until very recently there was a giant monitor (*Varanus priscus*) 25 feet long in Australia.

Those naturalists who do admit that there is probably a large reptile

unknown to science in Africa much prefer to think it a large monitor than a little dinosaur. This is not because the monitors belong to a more recent group than the dinosaurs. There are, as I have already remarked, two main groups of dinosaurs: the Sauripelvians, which include the most enormous species, and the generally smaller Avipelvians. The latter group gradually ousted the first during the Jurassic and Cretaceous periods. The monitors also derive from the Jurassic period. The zoologists' objection to the "dragon" being one of the dinosaurs is that they all seem to have been extinct since the Cretaceous period. This, of course, is negative evidence, based on the absence of any trace of dinosaurs' remains in Tertiary and Quaternary deposits, and is far from conclusive. The latest traces of the Rhynchocephalians, which *preceded the dinosaurs*, belong to the very beginning of the Mesozoic era, yet there is a living Rhynchocephalian in New Zealand. It is the *tuatara*.

There are two more trivial objections to surviving dinosaurs. Firstly, they are far too large to remain hidden even in African swamps—this overlooks the fact that some dinosaurs were not much larger than a pigeon. Secondly, the idea of a dinosaur is far too "sensational" to be admitted by serious zoologists—this, apart from its irrelevance, could hardly be more absurd, for what is there "sensational" about a medium-sized vegetarian dinosaur, when the world still produces man-eating crocodiles more than 20 feet long?

All we can really say is that there seems to be a large and unknown reptile in Central Africa. Its identity remains to be determined, and in view of its size it is probably, like the crocodiles, the Komodo dragon and the giant tortoise, a relic of the great reptile empire that flourished in the Jurassic period. I have already mentioned the remarkable geological and climatic stability in Africa, which could hardly be better suited for preserving such an ancient type.

The most surprising aspect of the Congo "dragon" has been brilliantly expounded by Willy Ley. He shows that pictures of the beast are found not only in Central Africa but even on one of the most remarkable of ancient Babylonian monuments, the Ishtar Gate.

In 1902, after three years of excavation, when Professor Robert Koldewey brought to light the splendid arch raised by King Nebuchadnezzar to the glory of Marduk, supreme god of the Babylonians, he found that walls were decorated with glazed brick bas-reliefs representing alternate bulls and dragons. The king had proudly stated in a Cuneiform inscription:

Fierce bulls [*rimi*] and grim dragons [*sirrushu*] I put onto the gateyard [meaning the gateyard's walls] and thus supplied the gates with such overflowing rich splendour that all humanity may view it with wonderment.

The "fierce *rimi*" (plural of *rim*), often referred to in the Bible by the Hebrew word *re'em*, have been shown to be the aurochs (*Bos primigenius*), the terrible wild bulls which survived in Europe until the Middle Ages, the last survivor dying near Jaktorova in Lithuania in 1627. The *sirrush* (singular of *sirrushu*) is much more of a problem. It is a scaly quadruped with the front-legs of a lion and the back-legs of an eagle, with a snake's head on the end of a long neck. A forked tongue darts from its mouth, and it bears on its head a single horn, various wattle-like ornaments and even a short mane.

Bizarre though this animal is, it seems to be intended to be a real beast, since it has been alternated with very realistic bulls, and in the passage leading to the gate there is a double row of no less realistic lions. The three beasts seem to have been chosen as the three most powerful and savage creatures known. What can the dragon be?

If the Ishtar Gate had been excavated a century earlier [Willy Ley remarks], this combination of catlike forefeet and birdlike hind feet would have been sufficient proof that the "Glamour Snake" was no whit more credible than the winged bulls and man-headed birds of Assyrian and Babylonian mythology. During these hundred years, however, Georges Cuvier had become the "Father of Paleontology," Professor O. C. Marsh in America had earned the title of "Father of Dinosaurs," and our conceptions of what was biologically possible had changed greatly. Paleontologists had discovered fossil animals that sported endless necks and endless tails, big bodies and small heads, serpent heads with horns on them—and possibly even forked tongues (although unfortunately tongues do not fossilize)—and similar attributes. They had even found a special group of dinosaurs, the ornithischians, or "bird-footed ones," [1] that walked upright on their birdlike hind legs, waving smaller five-toed forelegs in the air.

Koldewey did not make this identification at once, though in his first report he admitted that the *sirrush* did agree in most of its features with some extinct saurian. "If only the fore-legs were not so emphatically and characteristically feline," he remarked, "such an animal might actually have existed."

[1] Ley has made a slip here. He means Ornithopods. Ornithischian, a synonym for Avipelvian, means "with a bird's pelvis" and refers to a much larger group which includes the Ornithopods, Stegosaurians, Ceratopsidae and Ankylosaurians.

East face of the Ishtar Gate showing alternating dragons and oxen.

Modern reconstruction of the Ceratosaurus by Charles R. Knight.

The *sirrush* or dragon of the Ishtar Gate.

In his sumptuous work *Das Ischtar-Tor in Babylon*, published in 1918, Professor Koldewey was bolder and more definite:

> If a creature like the *sirrush* existed in nature it would belong to the order of Dinosauria and the sub-order of Ornithopods. The iguanodon of the Cretaceous layers of Belgium is the closest relative of the dragon of Babylon.[1]

The Chaldeans were not palaeontologists. The *sirrush* cannot be a reconstruction of a long-dead animal. Nor is it likely to be one of the many Babylonian mythical beasts, constructed of a hotch-potch of other beasts, for while they had a very short life in Chaldean art, the *sirrush*, like the lion and the aurochs, was depicted over a period of nearly 2,000

109. Reconstruction of the Iguanodon, a running dinosaur that was herbivorous.

years from about 2800 B.C. to the reign of Nebuchadnezzar (1146–1123 B.C.). These figures, by the way, are based on the most recent information about Babylonian chronology, which differs considerably from Koldewey's.

There is also explicit reference to a live dragon at Babylon in the book of Bel and the Dragon in the Apocrypha:

> And in the same place there was a great dragon which they of Babylon worshipped.
>
> And the king said unto Daniel, wilt thou also say that this is of brass? lo, he liveth, he eateth and drinketh. Thou canst not say that he is no living god: therefore worship him.
>
> Then said Daniel unto the king . . . give me leave and I shall slay this dragon without sword or staff. The king said I give thee leave.

[1] The *sirrush* is more like the Ceratosaurus in having a little horn, but I shall show later why this identification is untenable.

> Then Daniel took pitch, and fat, and hair, and did seethe them together, and made lumps thereof: this he put in the dragon's mouth, and so the dragon burst in sunder . . .

Whether or not this living "dragon" in Babylon is anything more than apocryphal, it does not seem to have served as a direct model for the one on the Ishtar Gate and on many other Babylonian monuments; for the *sirrush* is certainly not an accurate picture of the Iguanodon or Ceratosaurus. But it is a good stylised likeness. Willy Ley thinks that the faults and absurdities in the *sirrush*'s picture, like those in the aurochs's, arose because the Babylonians thought both animals were "monsters of a far country," for he adds that the *rim* was then extinct in Mesopotamia.[1]

The *sirrush* could have lived in Central Africa, where it has been proved that the Chaldeans went, and where they could have seen a giant lizard. When Hans Schomburgk came back from Europe with native tales about the *chipekwe*, he also brought several glazed bricks of the same type as those on the Ishtar Gate. Naturally he had no idea that the beast and the bricks could have any connection—which Willy Ley was the first to recognise. It is therefore possible that one of the amphibious species of Congo "dragon," whether *isiququmadevu*, *mokéle-mbêmbe* or *badigui*, was known to the Chaldeans 5,000 years ago from travellers' tales, and that this beast was the origin of the *sirrush* on the Ishtar Gate.

This can be demonstrated by a simple experiment. Ask someone who has never seen a picture of a dinosaur—a child, for example—to make a drawing from your own verbal description of the Congo "dragon." They will begin by drawing a quadruped, similar in outline to some well-known beast (horse or cow, dog or cat), and then go on to give it the long tail and snake's neck and head. When you mention that it has large claws on its feet they will give it a lion's or a cat's paws. They will add the required ornament to its head, and when you say that it is a reptile, they will cover it with scales. There is every chance that the result will look very like a *sirrush* apart from the hind-legs. Repeat the experiment with another naïve and amenable artist, this time drawing a picture of a dinosaur, such as Charles Knight's Ceratosaurus facing page 480, from a dictated description, and the result will probably be a *sirrush* again, even down to the bird-like hind-feet.

[1] This seems to me debatable. On an Assyrian obelisk a king who is probably Tiglath-Pileser I (1115–1093 B.C.) is called "destroyer of the wild *rimi*, which he killed at the foot of the Lebanon." That this was worthy of mention implies that the *rim* was either very rare, or so savage that few dared to approach it. Hence certain mistakes in its picture.

All this seems to me to imply: (1) that the *sirrush* is based not on a direct knowledge of the Congo "dragon," but on a description derived by oral tradition from travellers' tales; (2) that the Congo "dragon," like the *sirrush*, had bird-like hind-feet; (3) that both animals are a reptile very similar to some of the bird-footed dinosaurs. This does not prove that the Congo "dragon" is a dinosaur, but the theory should not be rejected out of hand. We may even make a guess as to what dinosaur it is.

The Ornithopods, the group to which the iguanodon belongs, are not the only ones with birds' feet. The Theropods also have them, and include the Ceratosaurus, which has a little horn on the end of its nose, and which I have already suggested was particularly like the *sirrush*. But while the Ornithopods are herbivorous, the Theropods are formidable carnivores. The Congo "dragon" is a vegetarian, and cannot therefore be one of the Theropods. It is more like the Ornithopods, but not the Iguanodon, not only because it has a horn—a minor detail—but because it is essentially aquatic, while the Iguanodon is a running beast that normally stands on its hind-legs. The "dragon" seems to be more similar in its habits to the Trachodontidae or duck-billed dinosaurs, which spend most of their time in the water and often move on four feet. But the Trachodontidae do not have the long and flexible neck so characteristic of our "dragon."

110. A running dinosaur that was carnivorous, the Tyrannosaurus.

Actually we only know a minute fraction of the dinosaurs that once inhabited the whole earth, and the Congo "dragon" does not exactly agree with a reconstruction of any that have been disinterred.

If the argument based on the *sirrush* has any value, the beast must be an Ornithopod. If it has none, we must admit that the animal's description is a much better likeness of a Brontosaurus, the animal with which by some strange irony of fate ignorant journalists confused the

imaginary Ceratopsian invented by those hoaxers Lepage and Gapelle: it would not be a true Brontosaurus, of course, but a long-necked and much smaller Sauropod of the same family.

All this supposes that it *is* a dinosaur, which is far from being proved.

I need hardly say that despite all the evidence, many zoologists are as sceptical as ever about its existence. In 1953 Willy Ley published in a new American magazine an article on the *Congo Dragon*, being a revision of his chapter on "The Dragon of the Ishtar Gate". In his first paragraph he remarks that it is

> an animal that may be a surviving dinosaur. At any rate it is an animal which looks like one, even though zoologists, after examining it, may conclude that it is not, strictly speaking, a dinosaur but a different reptilian type.

This article brought a thundering reply from Dr Edwin H. Colbert, Curator of Fossil Reptiles and Amphibians in the American Museum of Natural History in New York:

> This digs up all the old specious arguments on whether dinosaurs still exist and hashes them over again. This is the type of stuff one might expect in a Sunday supplement of one of the less reputable newspapers. But why does it have to be brought into a magazine that is trying to represent itself as an authoritative and carefully written journal devoted to animals?

The race of Cuviers and Owens is not extinct. So much the better. Heraclitus of Ephesus used to aver that Polemos, strife, was the father of everything, and that without opposition and competition nothing could grow and prosper. Modern biology maintains that life is a conflict between a conservative stabilising principle of heredity and a dynamic and creative force of evolution. Without the stabilising effect of heredity it would have fallen into chaos, offspring being unable to succeed their parents; and without the adaptability that evolution gives it, it would have been at the mercy of the smallest change of climate. So long as zoology is to be a living science it must have a conservative element of rigorous, positive and dogmatic minds and also a revolutionary element of adventurous, ardent and imaginative spirits. It needs both Cuvier an Lamarck, Owen and Darwin, Lehmann-Nitsche and Ameghino, Edwin Colbert and Willy Ley.

CHAPTER TWENTY-ONE

Kongamato, the Last Flying Dragon

> People call them Pterodactyles: but that is only because they are ashamed to call them flying dragons, after denying so long that flying dragons could exist.
>
> CHARLES KINGSLEY, *The Water-Babies.*

PROFESSOR CHALLENGER had returned triumphant from his expedition to his Lost World, and was lecturing to the Zoological Society of London in Queen's Hall, not without interruption from the sceptical Dr Illingworth, when the following dialogue occurred:

> Professor Challenger: ". . . upon the domestic habits of the pterodactyl we can throw a flood of light. I can exhibit to you from my portfolio a picture of that creature taken from life which would convince you——"
> Dr Illingworth: "No picture could convince us of anything."
> Professor Challenger: "You would require to see the thing itself?"
> Dr Illingworth: "Undoubtedly."
> Professor Challenger: "And you would accept that?"
> Dr Illingworth (Laughing): "Beyond a doubt."

A large packing-case was brought on to the platform, while the horrified audience watched, and suddenly the most hideous of beasts leapt out of it like a jack-in-the-box.

> The face of the creature was like the wildest gargoyle that the imagination of a mad mediæval builder could have conceived. It was malicious, horrible, with two small red eyes as bright as points of burning coal. Its long, savage mouth, which was held half-open, was full of a double row of shark-like teeth. Its shoulders were humped, and round them were draped what appeared to be a faded grey shawl. It was the devil of our childhood in person.

Thus it is not impossible that flying lizards might have survived until today in places inland without leaving the least trace of a fossil.

There is in fact a sort of aerial lizard living today, the "flying dragon" (*Draco volans*) of the Malay archipelago. But it hardly deserves the name, for it does not really fly, but merely glides from tree to tree on folds of loose skin supported by movable extensions of its ribs, like the ribs of an umbrella. It is barely 4¾ inches long and may glide as much as 15 feet, losing about 5 feet of height in doing so. The more modest name of "butterfly-lizard," sometimes given it because it looks like a huge butterfly, certainly suits it better than "dragon."

This little beast has nothing in common with the Pterosaurians of the Mesozoic era which probably flew like bats, though actually we know very little about them. A flying reptile seems a contradiction in terms, a creature that both flies and crawls; and the result is naturally bizarre. When Cuvier reconstructed the Pterodactyl from its fossil remains he described it in language no less romantic than Conan Doyle's:

> From this data one can draw the Pterodactyl in its living state; but the picture will be so extraordinary that it seems the result of a diseased imagination rather than the normal forces of nature.

112. The "flying dragon" or "butterfly-lizard."

To complete the confusion, these reptiles very likely did not share the most typical features of the class to which they certainly belonged. True flight needs powerful wing-beats involving a great expenditure of energy. To avoid a fatal loss of heat the Pterosaurians must have had a fairly efficient system for regulating their body temperature, like that of the birds and bats. Now, for an organism to remain at constant temperature it must have fur or feathers to prevent it from losing too much heat on its surface. The flying reptiles do not seem to have had feathers, the imprints of their bodies show that they had wings of membrane. Some of them may have had fur. On the Rhamphorhynchus's enormous tail

113. Reconstruction of the Rhamphorhynchus.

traces have been found of hairs and of the sebaceous glands that secrete an oily fluid to keep the fur in good order.

Most of the Pterosaurians ranged from the size of a sparrow to that of an eagle, but there was also a vast American species, the Pteranodon, with a wing-span of 24 feet—double that of the largest living flying animal, the wandering albatross (*Diomedea exulans*), which reaches 12 feet. The Pteranodon was an incredible beast. Its head was flattened in such an extraordinary way and extended behind in such a long bony crest that it must have been used as a rudder and performed the normal function of a tail.

But the rumoured flying lizard in Africa is a much smaller beast—no more than 7 feet in wing-span. If it is a Pterosaurian it is most like the

Pterodactyl itself, which is notable not for its long tail like the Rhamphorhynchus, but for its long jaws which betray its carnivorous habits. It is a little flying crocodile.

Colonel C. R. S. Pitman tends to confirm Melland's story. In *A Game-Warden Takes Stock* (1942) he writes:

> When in Northern Rhodesia I heard of a mythical beast which intrigued me considerably. It was said to haunt formerly, and perhaps still to haunt, a dense, swampy forest region in the neighbourhood of the Angola and Congo borders. To look upon it is death. But the most amazing feature of this mystery beast is its suggested identity with a creature bat-bird-like in form on a gigantic scale strangely reminiscent of the prehistoric pterodactyl. From where does the primitive African derive such a fanciful idea?

Professor C. Wiman of Uppsala University attempted to answer this question in 1928, when one of his sons who was living in Northern Rhodesia drew his attention to Melland's book. Wiman's solution was simple enough. In the Museum für Naturkunde in Berlin there are the bones of Pterosaurians excavated by the Germans from Cretaceous deposits in East Africa. At Tendagaru whole families of natives took part in this great work. Dr Wiman thinks that during these excavations the Africans were shown pictures of Pterodactyls, and he concludes:

> Hence it is quite natural that a legend of living Pterosaurians should have arisen. Nevertheless it is remarkable that after its long migration from Tendagaru to north-western Rhodesia this legend should have still retained a kernel of truth. Since there is this kernel it is to be feared that in the future this legend will remain alive even in the minds of Whites.

It is certainly remarkable, as Dr Wiman says, that in Africa, where the communications are so poor (especially 30 years ago), the legend should have travelled 1,000 miles without perceptible alteration. If his explanation is correct, why did the Northern Rhodesian natives put the beast in the Jiundu marshes and not in the lakes of Tanganyika, where the legend had come from? Besides, we should expect to find a similar legend all along the route it had travelled, especially around Lakes Mweru and Bangweulu which lie half-way. But there is no trace of one. On the contrary it is found in a different direction. Professor J. L. B. Smith the celebrated "father" of the Coelacanth writes in *Old Fourlegs*:

> The descendants of a missionary who had lived near Mount Kilimandjaro wrote from Germany giving a good deal of information about

flying dragons they believed still to live in those parts. The family had repeatedly heard of them from the natives, and one man had actually seen such a creature at night. I did not and do not dispute at least the possibility that some such creature may still exist.

A. Blayney Percival in *A Game Ranger on Safari* (1928) reports that:

> the Kitui Wakamba tell of a huge flying beast which comes down from Mount Kenya by night; they only see it against the sky, but they have seen its tracks; more, they have shown these to a white man, who told me about them, saying, he could make nothing of the spoor, which betrayed two feet, and an, apparently, heavy tail.

But the most convincing disproof of Dr Wiman's explanation is that a similar report comes from the opposite corner of Africa, the British Cameroons, and here the beast was seen by a naturalist sent out by the British Museum.

Ivan T. Sanderson, the well-known zoologist and writer, led the Percy Sladen Expedition to West Africa in 1932–3. When they were in the Assumbo mountains in the Cameroons, Sanderson and one of his companions pitched their camp on a little tongue of grass surrounded by wooded mountains. A very steep-banked river ran near by, and they were obliged to wade along it or leap from boulder to boulder when they wanted to go hunting. It was while working along the river in this way that Sanderson shot a large fruit-eating bat, which fell into the river. He went into the water to fish it out, but stepped on something which moved—probably a turtle—lost his balance and was nearly carried away by the current. He was floundering back towards his rock when suddenly his companion, George, shouted, "Look out!"

> And I looked. Then I let out a shout also and instantly bobbed down under the water, because, coming straight at me only a few feet above the water was a black thing the size of an eagle. I had only a glimpse of its face, yet that was quite sufficient, for its lower jaw hung open and bore a semicircle of pointed white teeth set about their own width apart from each other.
>
> When I emerged, it was gone. George was facing the other way blazing off his second barrel. I arrived dripping on my rock and we looked at each other.
>
> "Will it come back?" we chorused.
>
> And just before it became too dark to see, it came again, hurtling back down the river, its teeth chattering, the air "shss-shssing" as it was cleft by the great, black, dracula-like wings. We were both off-guard, my gun was unloaded, and the brute made straight for George. He ducked. The animal soared over him and was at once swallowed up in the night.

Sanderson and his companion returned to their camp, where they found several native hunters who had come miles in order to sell them specimens of animals.

"What kind of bat is it," asked Sanderson, spreading his arms, "that has wings like this and is all black?"

"*Olitiau!*" replied one of them, and there was a short palaver in Assumbo. At last one old hunter asked:

"Where you see this beef?"

"There," replied Sanderson, pointing towards the river.

With one accord the hunters grabbed up their guns and ran out of camp, straight across country towards the village, leaving their hard-earned goods behind them.

This evidence comes from a first-rate naturalist whose works are authorities all over the world. He has refrained from making any comment about the strange animal in this book, but as it happens this is evidence of his good faith. He speaks of it as a sort of bat, but we may be certain that it is no known species. Indeed, it is so obvious to a zoologist that he did not think it worth mentioning. For the general reader I will explain why.

The bats, which form the order of Chiroptera, are divided into two very distinct groups: the Megachiroptera or greater bats and the Microchiroptera or lesser bats. They differ not only in size but also in diet. The Megachiroptera are called "fruit-eating bats." The most typical of this sub-order is the flying-fox (*Pteropus*), the largest known bat. The edible Malayan species (*P. edulis*) may have a wing-span of as much as 5 feet 6 inches. By comparison eagles are often more

114. Head of the flying-fox.

than 6 feet 6 inches in wing-span and sometimes reach as much as 8 feet.

The flying-fox, which does indeed have an attractive fox-like head, is a shy and timid animal; in captivity it is easily tamed and makes an affectionate and lovable pet. There are several species of Megachiroptera in Africa, but their wing-span never exceeds 4 feet. One of the largest is the hammer-headed bat, which well deserves its Latin name of *Hypsignathus monstrosus*, though only for its appearance, since it is a perfectly harmless beast, the last creature in the world that one would expect to dive and attack a man.

It is true that Sanderson's story may make one wonder whether the creature that attacked him was not a parent or mate of the bat he had

115. Head of the hammer-headed bat.

just shot. In grief and despair, even the most peaceable of animals are sometimes capable of acts of unusual bravery to revenge a dead mate or young. Moreover, the Megachiroptera do have the very widely-spaced teeth that Sanderson noticed. The hammer-headed bat belongs to West Africa, and as Sanderson himself pointed out in his *Living Mammals of the World*, these bats "for reasons unknown do a lot of dipping into water," so one might be tempted to suggest that it was one of these monstrous animals which had innocently attacked the naturalists wading in the river. But there are two objections to this identification. The unknown beast was black all over, while all the African flying-foxes are a brownish, or even a yellowish mahogany colour. Moreover the negroes' terror implies that the animal was habitually aggressive, which a beast that fed only on fruit would hardly be.

Only the Microchiroptera are carnivorous; their food varies with the species: insects, fish, frogs, small birds, small mammals and even the blood of large mammals. Some also eat fruit. Not all of them are so very small. Many of them are larger than many of the Megachiroptera. The species usually considered to be the largest, the Australian giant false vampire (*Megaderma gigas*), has a wing-span of 2 feet 6 inches, which is by no means contemptible.[1] Moreover, the false vampires are admittedly fierce and bold: they attack smaller bats and even birds. An angry *Megaderma* might very well dive at a man who had wounded or upset it. But the largest African species, the yellow-winged bat (*Lavia frons*), never has a wing-span of more than 15 inches; it is fond of certain aquatic insects and always stays close to the water and, unlike most bats, hunts for its food during part of the day. It is therefore tempting to suppose that Sanderson's beast might have been a *Megaderma*, its dimensions exaggerated by fear. But the yellow-winged bat has wings the coppery colour of dead leaves, which is far from the alleged even black.

116. Head of the false vampire bat.

Thus we see that the large bats are usually gentle and are by no means aggressive, and that only the little bats are rapacious and often fierce. Neither agree with the description of the huge and formidable *olitiau*, which, if it is a bat at all, belongs to a quite unknown and extraordinary species. But perhaps it is not a bat.[2]

There is no doubt that the *olitiau* can be compared with the *kongamato* of Northern Rhodesia. The general appearance, the size, the long jaws bristling with teeth, the habitat by the water's edge, and the panic it causes among the natives all agree. And Sanderson's story may help to explain one of the *kongamato*'s alleged habits which might otherwise have seemed absurd: its reputation for capsizing canoes. Professor

[1] The giant false vampire bat is probably not the biggest of Microchiroptera in the world. In 1934 Raymond Ditmars showed that the javelin bat (*Vampyrus*) of the Amazon may have a wing-span of as much as a yard, and that it will attack birds as big as a pigeon.

[2] Sanderson is convinced the *olitiau* is a bat. He wrote to me just before this book went to press: "This whole Pterodactyl bit was wished on me by Frank Lane, but I never even suggested such a thing . . . I plunk for a bit rather than a Pterodactyl and I wish to God Frank had not thought that up. I have enough trouble with other people's facts let alone being clobbered with a fancy of my own."

Wiman had already remarked that this was hardly the behaviour one would expect of a Pterodactyl—nor, I might add, of a bat. But if the *kongamato* like the *olitiau* is in the habit of diving at men crossing its territory—perhaps trying to drive them away—it is easy to see how it could make canoes capsize by suddenly terrifying the men at the paddles. Accidents of this kind would not have to happen very often—the men in the water being eventually eaten by crocodiles—for the *kongamato*'s terrible reputation to be firmly established on the survivors' tales.

Whether the *kongamato*—or *olitiau*—is a true Pterodactyl or a monstrous bat, its mystery remains to be solved. And the first naturalist who lets a specimen out of a box in the middle of a meeting of a learned society will make a mark in the annals of zoology.

The flying-fox is the largest of the bats.

The hammer-headed bat looks monstrous but is quite harmless.

The lemurs of Madagascar which u
recently had much larger relatives. (*Ab*
Maki gidro. (*Left*) *Maki vari*. (*Be*
Macaco, an example of sexual dimorph
rare in mammals.

Part Seven

THE LESSON OF THE MALAGASY GHOSTS

In one moment I've seen what has hitherto been
  Enveloped in absolute mystery,
And without extra charge I will give you at large
  A Lesson in Natural History.
    LEWIS CARROLL, *The Hunting of the Snark.*

Comoro Is.
C.d'Ambre
Port Leven
Nosy Bé
Ankaizinana Mts.
Bealanana
Majunga
L. Kinkony
Betsiboka
Ste Marie I
L. Alaotra
R. Ikopa
Maintirano
Tamatave
Tananarive
Andevorante
Lake Itasy
Ankarata Mts.
Moramanga
Belo
Mahajilo
Betafo
Antsirabe
Mananjary
Fianarantsoa
Mangoky
Ankazoabo
Manakara
Isalo Plateau
Farafangana
R. Onilahy
Fort Dauphin
C. Ste Marie
Miles
100
200
Mountain Grassland and Woodland

CHAPTER TWENTY-TWO

Tratratratra, Vorompatra, etcetera

> Madagascar is another land of promise. Here, too, mountain and forest prevail; situation is favourable; and we know almost nothing of the interior.
>
> P. H. Gosse, *The Romance of Natural History.*

Once upon a time there was a famous doctor who cured all his patients (this is a fable, of course); his one fault was that he was very incredulous. One day a little girl came running to him, quite distracted, and begged him to leave everything and hurry to her mother's sick-bed.

"Your mother is all right, my child," he replied with a smile, "she imagines she is ill, but actually she's as sound as a bell. Don't worry, she will get well by herself."

"But, doctor, she is in terrible pain!"

"Never mind. Run along now, I have other things to do."

The little girl went. The mother died. And the doctor proved that it was not enough to have complete mastery of his art. His first duty was to examine his patients.

Many zoologists have this doctor's fault, with equally tragic results in a different sphere. While they remain obstinately deaf to rumours about unknown or supposedly fossil animals, these animals die out, some are already extinct, and we have lost the opportunity of studying them except as wretched remains. Their intellectual deafness may well have prevented the zoologists from finding the solutions to some problems they are concerned with. This thesis is amply borne out by the history of our knowledge of the animals of Madagascar.

When Admiral Étienne de Flacourt published his *Histoire de la Grande Isle de Madagascar* in 1658 after a long stay in that country he gave a great deal of very exact information about the fauna which was so different from that of the African continent. But some of it was

disbelieved as mere travellers' tales and was only proved to be true after several centuries. Among the woodland birds he mentioned:

> *Vouroupatra*, a large bird which haunts the Ampatres and lays eggs like the ostrich's; so that the people of these places may not take it, it seeks the most lonely places.[1]

Subsequent travellers told more detailed but also more fantastic tales about the bird's size, saying that its eggs were enormous, eight times as large as an ostrich's, big enough for the natives to use as tanks for drinking-water. Needless to say, hardly anyone believed these tales. The ostrich was already a monstrously large bird at 8 feet high. A bird that laid eggs eight times as large would have to be impossibly huge. Orientalists suggested that these tales were just another version of the legend of the roc which Arab seamen believed could carry off a whole ship and her crew. Sinbad the Sailor ran across one in his second voyage after he found a roc's egg, which at first he mistook for a white dome of prodigious height and bulk: "I drew near it and walked around it, but perceived no door to it . . . I made a mark where I stood, and went round the dome measuring its circumference, and, lo, it was full fifty paces." This is a long way from the two-gallon shells reported in Madagascar.

Herodotus was told by Egyptian priests about a race of gigantic birds "beyond the sources of the Nile" which were strong enough to carry off a man. As the most powerful eagle cannot lift more than a rabbit or a small lamb, this would be a staggering feat, though nothing to that of the Arabian roc.

In the thirteenth century Marco Polo claimed that Kublai Khan had shown him a bird's feathers 90 spans (about 60 feet) long and two eggs of prodigious size.[2] He said that he thought the roc came from some islands to the south of Madagascar. But the roc and the huge bird of Madagascar were assumed to be equally fabulous.

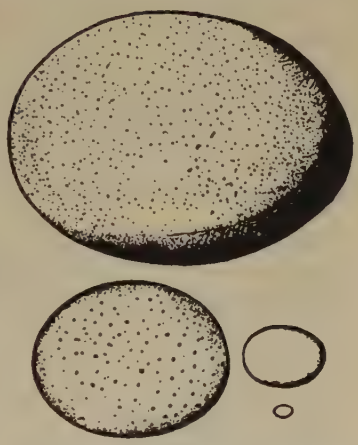
Nevertheless in 1832 the French naturalist Victor Sganzin actually saw an enormous half-eggshell in Madagascar. The natives were using it as a bowl. They would not sell it to him, so he drew a sketch of it, and in 1840 sent it to a renowned ornithologist from Paris, Jules Verreaux, then in Cape Town. In the meantime a traveller called Goudot found remains of similar eggs in Madagascar and showed them to Professor

[1] The word *vouroupatra* has certainly been misunderstood or misspelt by de Flacourt, the Malagasy word for bird being *voron*. Probably it should be *vorompatra*. The Ampatres are now known as the Antandroy; de Flacourt used the name of this tribe to describe the area they inhabit.

[2] The "feathers" may well have been palm-leaves.

Paul Gervais, of the Paris Museum, who attributed them at first to a sort of ostrich.

In *The Dodo and its Kindred* Dr Hugh Strickland suggested that on de Flacourt's evidence there might be a large Brevipennate bird in Madagascar (at this time the Ratites or running birds were known as Brevipennates because of their short wing-feathers). After the publication of his book in 1848 he received the following information from F. R. Surtees, who was then Her Majesty's Commissioner of Arbitration at the Cape of Good Hope.



117. Aepyornis's egg compared with an ostrich's, hen's and humming-bird's.

In October 1848 John Joliffe, the surgeon of H.M.S. *Geyser*, made friends with a passenger called Dumarele who was a French merchant in his sixties from Réunion. He noted in his private journal that

> After giving an account of some curious monkeys with white silvery hair M. Dumarele casually mentioned that some time previously, when in command of his own vessel trading along the coasts of Madagascar, he saw at Port Leven, on the north-west of the island, the shell of an enormous egg, the production of an unknown bird inhabiting the wilds of the country, which held the almost incredible quantity of *thirteen wine quart bottles of fluid*!!!, he having himself carefully measured the quantity. It was of the colour and appearance of an ostrich egg, and the substance of the shell was about the thickness of a Spanish dollar, and very hard in texture. It was brought on board by the natives (the race of "Sakalavas") to be filled with rum, having a tolerably large hole at one end, through which the contents of the egg had been extracted, and which served as the mouth of the vessel. M. Dumarele offered to purchase the egg from the natives, but they declined selling it, stating that it belonged to their chief, and that they could not dispose of it without his permission. The natives said the egg was found in the jungle, and observed that such eggs were *very very rarely* met with, and that the bird which produces them is still more rarely seen.

Joliffe thought that Dumarele was certainly telling the truth, but believed that he "was imposed upon in some way by the roguery of the natives." All the same he added:

> M. Dumarele's story should not be despised or discredited in these times, when such extraordinary discoveries are constantly made in every branch of science, but publicity should be given to this statement, that persons visiting Madagascar may, if possible, collect fresh information on the subject, and clear up the mystery. The sight of one sound egg would be worth a thousand theories.

Dr Strickland published these extracts from Joliffe's diary, making no comment except

> It is a singular circumstance, if nothing more, that Marco Polo refers the Roc, of Arabian Nights celebrity, to the island of Madagascar; but as the Roc, however gigantic, was decidedly not *brevipennate* [since its feathers were 90 spans long!] a discussion of its history would be irrelevant to our present subject.

Other naturalists concluded that both birds were equally fabulous, for nobody took much notice of these reports; they were not much publicised and seemed too fantastic to be true.

In 1851 the existence of a giant bird in Madagascar was at last officially admitted when a merchant captain called Abadie found three eggs and some fragmentary bones on the south-west coast of the island. They were presented to the Académie des Sciences at Paris by a certain M. Malavois. The two largest eggs were 13⅝ inches by 8½ inches and 12⅝ inches by 15⅜ inches, one being more elongated than the other. Their capacity was nearly 2 gallons. Each egg would have held six ostrich's eggs or 148 hen's eggs—enough to make an omelette for 70 people.

On the strength of these eggs and bones and with the precedent of Owen's *Dinornis*, described in 1839, Isidore Geoffroy-Saint-Hilaire christened the Madagascar bird, naming it *Aepyornis maximus*, or "the tallest of the high birds." This name was not entirely deserved. The tallest of the birds was not the Aepyornis but the moa, or rather one of the moa tribe, which reached a height of over 11 feet. Geoffroy-Saint-Hilaire deduced that the Aepyornis must be 16 feet high partly because its egg was double the dimensions of an ostrich's. Actually the Aepyornis very rarely reaches 10 feet: it is a bulky rather than a tall bird.

In 1866 the explorer Alfred Grandidier fished out of pools at Ambolisatra some huge bones in a perfect state of preservation. At first sight they seemed to belong to some large pachyderm, but when examined they proved to belong to the mysterious Aepyornis which was at once nicknamed "elephant-bird." Soon enough other bones were disinterred

for the huge bird's whole skeleton to be deduced. The complete skeleton of *Aepyornis maximus* reconstructed at the Paris Museum is 8 feet 9 inches high—a very respectable size for this bird.[1] There is no constant ratio between the size of a bird and the eggs it lays. The kiwi's eggs are as big as a medium-sized ostrich's, 5 inches by 2¾ inches, although the bird itself is hardly any larger than a hen. Its body is only three times as heavy as its egg.

All the same, even if *Aepyornis maximus* is not the tallest known bird, it is the largest and weightiest. Dean Amadon, an ornithologist of the American Museum of Natural History, has measured the principal Aepyornis and moa bones and compared them with those of the most similar living birds, the ostrich, rhea and emu, and has deduced that the *Aepyornis maximus* weighed 965 pounds, while a 10-foot moa weighed only 520 pounds. The smaller, dumpier moas were no doubt proportionately heavier and more like the Aepyornis.

Gian-Giuseppe Bianconi, a zoologist from Bologna, was so convinced that the Aepyornis and the roc were quite identical, that he published no less than 18 notes between 1862 and 1865 in his attempts to prove that the remains of birds found in Madagascar belonged to a giant bird of prey related to the Andean condor. But in due course a more thorough study of the Aepyornis's bones made it clear enough that, unlike the legendary roc, it could no more fly than the ostrich, cassowary, emu and other running birds. Like them, it had no breastbone, and its wings were useless stumps. All the same, there is little doubt that it was the bird that de Flacourt described by the name of *Vouroupatra*. Does this mean that it was still alive then? There is no doubt that the eggs found in the sand-dunes and mud around the great pools in the south and south-west were sometimes so fresh that they seemed to have been laid quite recently. The bones were equally fresh. And the natives said that the giant birds lived in the thickest forests of the island but were very rarely seen.

Unfortunately most naturalists were still so soaked in Cuvier's ideas that they refused to believe that such a monstrous bird could survive and, instead of looking for the bird itself, racked their brains to find out why it was extinct. Man could not be directly responsible. Unlike the moa, the *vorompatra* had not been slaughtered for its meat. There is no local legend to this effect, and the natives were not thought to be well

[1] *Aepyornis maximus* is the largest of the three known species. The smallest, *A. hildebrandtii*, is no bigger than an ostrich. *A. medius* is intermediate in size. The Aepyornis differs from the ostrich much more in weight than in height.

enough armed to hunt it—though, since the Maoris killed moas with nothing but stone-headed spears, this argument is rather weak.

Some have even gone as far as to allege that noxious natural gases escaping from the ground killed off the Aepyornis. But to find the most likely explanation we should consider the bird's habits. It is generally thought to be a bird of the bush, like the ostrich, though the natives insist that it lives in the forest. Certainly it is more likely that a slow and heavy bird would take refuge in the forest. On the other hand, the conditions in which its eggs are found lead one to believe that it laid them on the rushes like a moorhen. From its anatomy it might well have been largely aquatic and spent its time paddling in wooded swamps.

The fairly recent and drastic change of climate, when the rains dwindled, dried up the immense lakes in the high plateaux and the swampy areas of Antsirabé and Betafo. Forced to huddle in ever more wretched little pools, the Aepyornis would have eventually become extinct for lack of food and suitable shelter. The heaps of their remains in peat-bogs support this theory.

No doubt the thoughtless deforestation perpetrated by Bantu, Malay and Arab invaders had a decisive effect on the change of climate, and thus man indirectly hastened the *vorompatra*'s end. Since he has only arrived in the island fairly recently—for no prehistoric human remains have ever been found on Madagascar—it is very possible that the great bird survived until not at all long ago. The consequences of the gradual destruction of the virgin forest would have taken quite a long time to make themselves felt, and until 1867, if not later, the natives maintained that the *vorompatra* still lived in some remote areas. Today there is no hope of finding a living specimen, because the swampy forest that was its peculiar habitat has decreased so dramatically.

If the naturalists in the last century had not been so incredulous of Malagasy legends and travellers' tales, but had searched systematically for de Flacourt's *Vouroupatra*, we might know much more about this extraordinary bird which may have aped the hippopotamus in its habits, as it did in its structure.

The change in climate exterminated other Malagasy birds, among them the *Mullerornis*, a large cassowary from the Ankaratra area, and the *Centrornis*, a relative of the spur-winged goose of the African mainland. It was also said to be the death-knell for several giants of very different groups; so that today Madagascar's fauna consists only of small or medium-sized species. But is this necessarily true? The

change in climate was not sudden and was so recent there is still a faint hope of finding some survivors of these giants of the past.

Like the neighbouring Mascarene and Seychelle islands, Madagascar once boasted a giant tortoise (*Testudo grandidieri*), which was considerably more than 3 feet long and weighed more than a ton. It liked to bask in the sun, half-submerged in shallow water, and seems also to have been a victim of the same drought. But Raymond Decary, former head of the colonial service associated with the Paris Museum and author of the authoritative work on Madagascar's fauna, writes:

> It has been established that a mysterious animal which may be a large tortoise lives in certain lakes in the caves in the south-west: is it a last survivor of *Testudo grandidieri*?

Besides the species of crocodile known today (*Crocodylus madagascariensis*) which is identical with the Nile crocodile, there was until recently also a giant species (*C. robustus*), with a skull 2 feet 6 inches long. Specialists have long debated whether there are one or two species of crocodile on the island, and the question is still far from settled. So it would not be at all surprising if *C. robustus*, found in a sub-fossil state by Alfred Grandidier, proved to be surviving today. In any case there seem to have been giant crocodiles in Madagascar until recently, for in 1802 the French naturalist Pierre Denys de Montfort, speaking of the incredible length that some crocodiles were alleged to be, said that "new and trustworthy accounts say that there are some in Madagascar which reach 60 feet." Even allowing for obvious exaggeration, this is a long way from the maximum length of present African crocodiles which is 20 feet.

Another victim of the disastrous drought is the hippopotamus. There was once a small species in Madagascar related to the Pleistocene fossil hippopotami found in Africa. Its extinction is usually thought to have occurred several thousand years ago. Yet it is odd that the great navigator Dumont d'Urville mentioned in that fictitious omnibus of facts about the world, his *Voyage Autour du Monde*, published in 1829, that there were hippopotami in the rivers of Madagascar. Moreover the hippopotamus, or a distorted traditional picture of it, is said to be the origin of the legend of the *tsomgomby*, a fabulous monster described as a humpless water-buffalo or as an animal not unlike a horse or a mule. If the *tsomgomby* really derives from a memory of the hippopotamus, which may have abounded in ancient times but must have become very rare after the Europeans' arrival, it has certainly been much altered on

the way, for some of the Malagasy say that the monster has huge hanging ears, a cry that freezes you with terror, and savage and cannibalistic habits. Decary adds that:

> The Mahafaly and Antandroy think that it lays the large eggs from the south which are really Aepyornis eggs. One day when I was excavating bones from a deposit near Ambovombé, the Antandroy told me that the largest (which are those of an Aepyornis) belonged to the famous *tsomgomby*. In the Sakalava country this animal's tracks were pointed out to me; after examining them I was convinced, despite their poor condition, that they had been made by . . . a crocodile which had come a long way from the water.

Thus one may suspect that the legendary *tsomgomby* is based not only on a memory of a sub-fossil hippopotamus, but also upon some kind of reptile, especially in view of the Malagasy tales about the *railalomena* which means "father—or ancestor—of the hippopotamus." This beast is supposed to live in the swamps and to have a single horn in the middle of its forehead—like the Congo dragon. Did the Bantus bring the legend of this mysterious great reptile to Madagascar, or was there a species in the island itself? Either is possible. Certainly both animals seem to be mixed in the native mind. The hippopotamus may be the origin of the *tsomgomby* and the pseudo-dinosaur of the *railalomena*, but some details have been transferred from one to the other.

The two monsters have many of the Congo dragon's features; a hippopotamus's body, a single horn on the forehead, hanging ears (which may be the fleshy crest hanging on each side of the head as clearly shown in the dragon of the Ishtar Gate), they lay eggs like a reptile, live in the marshes, are rather aggressive and emit a terrifying cry. If the dragon lived in Madagascar its amphibious habits would make it one of the first victims when the swamps and lakes dried up—unless it is the mysterious animal like a giant tortoise, reputed in lakes and caves in the south-west and unless the tracks which Decary attributed to a wandering crocodile must really be attributed to a *tsomgomby*, a *tsomgomby* with reptile's feet.

Madagascar is the land of sub-fossil creatures. No other place in the world gives so strong an impression of having just emerged from Prehistory. The excavated remains of huge animals, whether they be birds, reptiles or mammals, are sometimes so fresh that one cannot help wondering whether the species they come from are really extinct. The native traditions often make it perfectly clear that they were known by

man until quite recently, for, according to van Gennep's principle, which I have already quoted, the memory of an event dies out in two centuries when there are no written traditions. This makes the old accounts of voyages so valuable to our knowledge of recently extinct animals.

Admiral Étienne de Flacourt did not only speak of the Aepyornis as a living bird. He also mentioned another animal which no zoologist has yet been able to trace:

> *Trétrétrétré* or *Tratratratra* is an animal as big as a two-year-old calf, with a round head and a man's face; the forefeet are like an ape's, and so are the hindfeet. It has frizzy hair, a short tail and ears like a man's. It is like the *tanacht* described by Ambroise Paré.[1] One has been seen near the Lipomani lagoon in the neighbourhood of which it lives. It is a very solitary animal, the people of the country are very frightened of it and run from it as it does from them.

Most naturalists, of course, took this animal to be mythical. No such grotesque beast could have lived in Madagascar, where there are no true monkeys and therefore no man-faced beasts with ape's feet. De Flacourt's tale was no more to be trusted than his repetition, in the middle of the seventeenth century, of the fable about dog-headed men that had been told by Ctesias, Marco Polo and many others. The sceptics received their first blow when the indris (*Indris brevicaudatus*) was found to exist. It is the largest of the lemurs known today and is extraordinarily like a little man with a dog's head. Three feet high and with no tail but an inconspicuous stump, the indris is astonishingly like a man in outline. Like the other lemurs, or half-monkeys, it has a fine and pointed muzzle, which makes its head more like a fox's or a dog's. When you have seen one it is easy to understand why the Betsimaraka

[1] Ambroise Paré quotes André Thévet who writes in book 2, chapter 10, of his *Cosmographie Universelle* (1575):

> At the time when I was on the Red Sea, certain Indians came from land, from the banks of the River Vachain, at one of the ends of Calicut, going westwards. They brought a monster the size and shape of a tiger, with no tail, but a face just like a well-proportioned man's except that the nose was snub: the hands in front like a man's and the feet behind like a tiger's, all covered with tawny fur. As to the head, ears, neck, and mouth, they were like a man's, with somewhat black and frizzled hair like the Blacks you see in Africa. The Indians had brought it from their country as a curiosity for us to see, out of their kindness and courtesy: and call this noble beast *Thanacth*: of which I have had a portrait drawn for you from nature.

This *thanacth* could conceivably have been the same animal as the *tratratratra* —or at least a related flat-faced lemur, but only if the Indians had brought it from Madagascar (partly populated by Malayan tribes) and not from Calicut.

118. The *thanacth* after André Thévet.

tribe both fear and worship the beast they significantly call *babakoto*, or "child-father." They believe it is a descendant of the men who used to hide in the forest to avoid working for the tribe. All the lemurs are *fady*, or taboo, to many of the tribes, for they are thought to have once been men. The indris is undoubtedly the most human-looking and therefore the most revered.

Since the legend of the dog-headed men proved to be so well-founded, more notice should have been taken of de Flacourt's report of the *tratratratra*. I don't know whether anyone ever looked for it "near the Lipomani lagoon"; certainly they never found it.

Palaeontological discoveries were, however, to prove conclusively that it might very well have existed. To explain the full significance of these man-faced demons' actual existence, about which many tales are still current, I must first say something about the way Madagascar's fauna reached that country through the ages and how it evolved.

One might reasonably expect to find the same fauna in Madagascar as in Africa except for a few insular differences. Actually the animals on

119. The indris, the largest known living lemur.

the island are sometimes quite original and sometimes related to creatures from as far afield as South America and South-East Asia. The most typical of Madagascar's fauna are the lemurs, which, like the monkeys, are primates, but have many distinctive features in their anatomy: the longer muzzle with a "wet nose" like a dog's, the claw on the second toe, the large ears and even more highly-developed eyeballs. It was because

of their wide, staring sleep-walkers' eyes that the old naturalists called them *lemures*, the Roman name for the ghosts of the dead.

The lemurs are so closely connected with Madagascar that few people realise that at the beginning of the Tertiary era they were found all over the world. They are often found in Eocene strata in North America and even in Europe. From Madagascar's size and position one might think that it had been the last refuge of these defenceless beasts, just as New Zealand was for the last rhynchocephalous reptile and Australia was for all the marsupials. But here the situation is a little different. The lemurs were not driven to Madagascar; it was the home from which they spread over the world, where they were almost all eventually ousted by the monkeys. Just then Madagascar was cut off from Africa and the island which had been their cradle remained their undisputed empire. Although three-quarters of the species of lemurs are found in Madagascar, there are galagos, pottos and angwantibos in Africa and the slender and slow loris in Asia, which have managed to survive by all becoming nocturnal. In Madagascar itself there are almost as many species which are active by day or at dusk as there are which are thoroughly nocturnal.

Madagascar is also the home of some small carnivores of quite a special type, the *Galidia* and *Galidictis*, genets with longitudinal stripes, the fanaloka (*Fossa fossa*), the odd anteater-civet (*Eupleres*), which has become insectivorous, and the strange fossa (*Cryptoprocta ferox*), a sort of cat with plantigrade feet. Madagascar is also the original home of the chameleons and boasts no less than 35 different species.

So much for originality. What is much more extraordinary is to find quite un-African forms of animals in this island off the African coast. All the insectivores there except the shrews belong to the family, exclusive to Madagascar, of tenrecs, whose nearest relatives are the almiquis (*Solenodon*) of the West Indies. The truly indigenous rodents also reveal secret links with America, the various species of Malagasy voles (the sub-family Nesomysinae) are closer to the American Cricetinae than to any in the Old World. There are also two kinds of iguana, though all the rest of this large family of lizards are found in South America.

On the other hand, the fauna of Madagascar, as I have remarked, is related to that of India and the Malay peninsula, where there are two nocturnal lemurs, the slow loris (*Nycticebus*) and the slender loris (*Loris*). This relationship is confirmed by the typically Asian frogs (*Racophorus*, *Dyscophorus* and *Calophrynus*) which are found in Madagascar.

This strange assortment of animals derives from very ancient geo-

graphic links. In the Palaeozoic era, the whole of the southern Atlantic and Pacific was filled by the vast continent of Gondwana, which embraced South America, Africa, South-East Asia and Australia. Madagascar lay almost in the middle, which explains how it came to be the centre from which various groups spread. It was the heart of the oldest continent.

During the Mesozoic and Tertiary eras this continent of Gondwana, upon which the sun never set, was gradually disintegrated and whittled away. First the eastern arm submerged into the ocean in the Jurassic, leaving nothing but Australia and the neighbouring islands. Gondwana was then merely a South Atlantic continent, but a huge promontory stretched right across the Indian Ocean and remained there until the Cretaceous period. This spit of land has been called Lemuria, for it is the centre from which the lemurs spread. The fact that it reached from East Africa to the middle of India helps to explain their present distribution.

Not until the Cretaceous period was the bridge broken between South America and Africa. The almiquis in the West Indies and the odd iguanas in Madagascar are the only living evidence of it that remains. Madagascar remained attached to India for a little longer, allowing a few lemurs to be exchanged for the frogs it had already received. During the Tertiary era it was only occasionally attached to Africa, to be finally cut off for ever in the Pliocene. These connections can only have been tenuous, for Madagascar has never had any of the ungulates that are the pride of Africa—with two exceptions: the hippopotamus, which is recently extinct, and the Malagasy wild pig (*Potamochoerus larvatus*), closely related to the bush pigs and the red river-hog of the African mainland. Both these are semi-aquatic species, leading one to believe that during the ungulates' period of expansion Madagascar must have been already cut off from Africa, but only by a narrow strip of water.

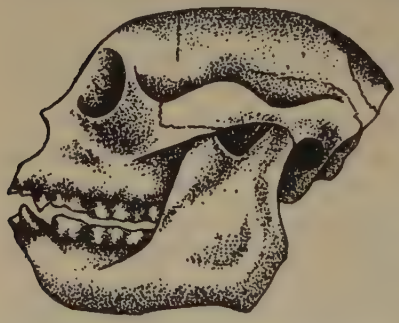
There is also a breed of wild oxen on the island, but they seem to be descended from tame cattle imported by the Bantus and returned to a state of nature. Some people connect them with a sub-fossil ox (*Bos madagascariensis*), but this does not disprove the theory that Madagascar was cut off only by a narrow strip of water. Cattle are not afraid to swim across quite wide rivers.

Safe from the large beasts of prey, almost without herbivores, and innocent of any monkeys, Madagascar was a perfect place in which the

lemurs could expand and flourish and become almost as varied as the marsupials in Australia.

This phenomenon of differentiation is not very striking in the species that are still extant. Apart from the aye-aye (*Daubentonia*), which, besides the other peculiar features of its anatomy, has a specifically rodent dentition—even though it is omnivorous—the rest of the lemurs seem fairly similar. All the same, it is a mistake to think that they are all small, long-tailed, nocturnal, arboreal and vegetarian quadrumanes of social habits. Some are tailless, others live in rocks, some are quite diurnal, many are insectivorous or even omnivorous, and according to the natives eat birds. And there are some which live alone or in pairs.[1]

The sub-fossil lemurs, which survived until quite recently, were much more varied in their habits and structure. The Megaladapis, with its concave rhinoceros-like skull and vast jaw-bones, was a true tree-dwelling pachyderm. Although it was as big as a cow it must have been able to haul itself slowly through the thickest of trees with its long, strong and prehensile fingers. The Palaeopithecus evolved by convergence an ape in Madagascar very similar to the African chimpanzee. The Hadropithecus aped man himself. Professor C. Lamberton of Tananarive, who has done remarkable work on the sub-fossil fauna of Madagascar, writes:



120. Skull of Hadropithecus with its astonishingly human profile.

> Its round head, its broad flat face, its almost straight nose standing well clear of the face, its eyes close together, the upright symphysis of its lower jaw all tend to make it look not merely ape-like, but almost like a human.

The Hadropithecus had stout limbs and probably usually moved on the ground. The bones of other, no less extraordinary lemurs have been found, and there may well be many more still undiscovered.

De Flacourt's description of the *tratratratra* no longer seems fantastic, and one must admit that it could well apply to what we know of the Palaeopithecus, for example. All the standard works say that *tratratratra*

[1] Generally speaking the small lemurs are nocturnal and live in pairs, while the large ones are diurnal and social.

is the vernacular for the Megaladapis, which, however, never had a round head and a man's face. This error has arisen because the Megaladapis was one of the first fossil lemurs known and was over-hastily used to explain the *tratratratra*. This obvious mistake has now been given the approval of science, and has unfortunately been accepted by such a work as Professor Osman Hill's monograph on the primates.

What of the other Malagasy tales of animals unknown to science? What, for instance, is the *tokandia* in the old saying "the *tsomgomby* goes straight ahead but the *tokandia* moves in jumps"? Legend says that it is a huge jumping quadruped, which climbs into the trees, where it lives. Its face is not like a man's, but it cries like a man.

Surely it is not pure chance that this barely credible legend of a large arboreal quadruped should be found in the only country where such an animal—the Megaladapis—has ever lived?

And what are we to make of the *kalanoro*, the Madagascan gnomes that Raymond Decary speaks of?

> All the tribes believe in the existence of little creatures similar to our gnomes and elves. Their name varies with the district: *Biby olona*, *Kokolampo*, *Kotokely*, and so on. The *Kalanoro* is, if I may say so, a sort of amphibious variety. In Lake Aloatra, the *Kalanoro* are women like naiads or mermaids, with hair that falls to their waists; they live at the bottom of the water in watertight palaces, seducing canoers and fishermen and luring away children. The Betsileo, on the other hand, believe that *Kalanoro* is a little land dwarf, which is not more than two feet high, entirely covered with long hair and is the wife of another dwarf called *Kotokely*; *Kalanoro* lives in caves where she lies on a fairy's bed made of silkworm cocoons. She is interested in the children of men, stealing them and substituting her own young; she makes the babies she has stolen drink special potions which prevent them from growing. Ill-favoured new-born children are sometimes called "sons of *Kalanoro*," and in the country the parents still keep careful watch at a birth to see that *Kalanoro* does not succeed in making an exchange.
>
> Around Lake Kinkony the Sakalava have a very different notion of the *Kalanoro*. This rather more masculine creature lives in the thickets and reeds on the edges of lagoons. It is less than three feet high; it has long hair and only three toes on its feet. It has a sweet woman's voice, lives on fish and raw food, and walks in the country in the evening. If you meet one, it will accost you and hold you in conversation while it gradually leads you away until you disappear into the lake. Farther north, on the other hand, the *Kalanoro* lives in woods and caves, and does not try to lead human beings astray, but it has hooked nails with which it can give cruel wounds to anyone who tries to capture it; it lives on milk, which it sometimes comes and steals even from the natives'

huts. In short, young and old fear the *Kalanoro*, whose name parents invoke to make their children keep quiet.

These legends may be fantastic, but they are found all over Madagascar, and it would be odd if they were utterly without foundation. Professor Lamberton wisely says:

> The freshness of the bones found in the south-east, as well as the state of the deposits, seems to show that the Hadropithecus must have lived until quite recently, at least in the Bara country, and one may well wonder whether the legend of the *Kalanoro*, which still thrives especially in the Ankazoabo district, does not refer to these animals. According to the Bara, the *Kalanoro* are little long-haired men who still live in the forests in the district and come out at night to prowl the villages in search of food. They run and climb very nimbly.
>
> All this agrees well enough with what we might expect of the Hadropithecus, and it is not impossible that the natives who lived in this area only a few centuries ago saw these animals, the memory of which has been handed down from generation to generation, gradually being altered to become more and more mysterious, as is the rule among primitive peoples.

But as some areas of Madagascar are still almost unexplored, such as the Ambongo reserve and the lonely Isalo mountains, and there are still some 8 or 9 million acres of virgin forest, it would be rash to assert categorically that not a single giant lemur survives. After all, the okapi, which is as big as a horse, remained unknown for a long time because of its nocturnal habits.

Raymond Decary, who has written about the mysterious beasts of Malagasy legend at some length, thinks that most of them are mythical, though they derive in part from the sub-fossil hippopotami and lemurs "which haunted the forests and waters only a few centuries ago, and the memory of which has been confused, giving rise to legendary beliefs." But there are others which he thinks look more real—the *habéby*, for instance, which the Betsileo call *fotsiaondré*, or white sheep. It is a purely nocturnal beast, which is said to be sometimes seen by moonlight in the uninhabited wastes of the Isalo range. It is as large as a sheep and is also supposed to have a cloven hoof and a white coat, somewhat spotted with buff or black. It has a long muzzle, long furry ears and large staring eyes. Some say that it is a beast of prey, but another version, according to which it is vegetarian, is more likely to be correct. Little-known animals are commonly assumed to be more savage than they really are.

Personally I very much doubt whether the *habéby* is really a sort of sheep, for sheep are not in the least nocturnal. Besides, no one seems to have ever seen a *habéby* ram, at all events they have never mentioned horns.

On the other hand, some of the lemurs are curiously specialised. Perhaps there are some types we have never dreamt of, and perhaps a branch has developed parallel to the Megaladapis and has chosen to live on the ground because of its great weight. This would not be odd. Even among the monkeys there are the baboons, which have completely given up living in trees. The *habéby*'s large and staring eyes, which all witnesses insist upon, are not at all like an ungulate's, though they are a striking feature of the lemurs, especially the nocturnal species, which are the most ghostlike of all.

Admiral de Flacourt reports yet another puzzling Malagasy animal:

> *Mangarsahoc* is a very large beast, which has a round foot like a horse's and very long ears; when it comes down a mountain it can hardly see before it, because its ears hide its eyes; it makes a loud cry in the manner of an ass. I think it may be a wild ass.

Ten years later, in 1770, the Comte de Modave said that the animal lived some 10 leagues from Fort Dauphin, describing it as follows in his correspondence (hitherto unpublished):

> This animal is much feared by the negroes, who give terrifying descriptions of it; at bottom it is but a wild ass; many are found in this part of the island, but you must look for them in the woods, for they never leave these lonely places and are hard to approach.

Decary says that in Anosy they still speak of an animal called *mangarisaoka* (literally "whose ears hide its chin"), which is of course the same as de Flacourt's *Mangarsahoc*, and thinks that the *tokatongotra* from the lonely south may be a similar animal. Its name means "single-footed," in the sense that a horse or a donkey is a "soliped," and it is not unlike these animals. Decary thinks it may derive from an ancient tradition that wild horses used to live in the south.

A wild ass has several times been reported in the Ankaizinana forests and the Bealanana and Manirenjy districts. Tracks of its hooves have been found. This harmless beast (if it really is an ass) has a vile reputation among the natives, who think that the mere sight of it will bring bad luck. It was the subject of a manuscript report by the administrator Bollon in 1936.

It is significant that several naturalists are almost ready to admit that

in Madagascar there is a wild ass or horse which no white man has ever seen and of which not the slightest remains have been found, yet they flatly refuse to consider the possibility that any large lemurs can have survived. These nimble, intelligent creatures which live in forests and are nocturnal in habits would have a much better chance than a horse or ass of eluding our searches. And their ghostlike, owlish eyes would be able to arouse the greatest superstitious terror among the natives. The survival of sub-fossil animals in Madagascar is denied out of the same obstinate prejudice that I have attacked throughout this book. It all stems from an obsolete scientific doctrine, Cuvier's Revolutions of the Globe.

Madagascar seems to have its own variety of many of the unknown animals that belong elsewhere. The *railalomena* echoes the Congo dragon, the *kalanoro* is a pendant to the tales of the *nittaewo*, *orang pendek*, *agogwe* and other African dwarfs. It has a version of the *kongamato* (or *olitiau*) in its *fangalabolo*, "that-which-seizes-the-hair," a giant bat which dives upon belated travellers and tears their faces and hair.

Madagascar even has its own version of the Australian *bunyip* or the Patagonian *iemisch*: it is the *kavay* of the Ankaizinana mountains, the terror of the Tsimihety. This aquatic animal is supposed to creep craftily out of the water to tear the eyes out of incautious travellers.

The Malagasy also believe in a gigantic hydra, a three-coloured serpent with seven heads called *fanampitoloho*, which is rather like the Australian bushmen's rainbow snake and other similar myths. When it rises above the water its heads touch the sky, and the wash that it makes can destroy a whole village.

This fantastic monster turns out to be a poetic personification of the waterspouts that sometimes arise on large lakes like Alaotra and Itasy. Surely there is *some* truth behind the more prosaic legends of the *fangalabolo*, the *kavay* and the other mysterious animals described in this chapter, and surely the simplest solution is that they derive from a traditional memory, distorted in the handing down, of sub-fossil animals. Are we to believe that during the last few centuries we have let them all die out without having so much as a glimpse of one of them: the giant birds, giant tortoises, giant crocodiles and giant lemurs—the Brobdingnagian inhabitants of this Lilliputian continent? It would be a remarkably bad run of ill-luck. If there is the faintest hope of finding a single one of these creatures alive, we should be mad to neglect it.

Some of them have certainly vanished. They have been lost to zoo-

logy forever because modern zoologists have been too incredulous or too incurious. We must not repeat their mistake.

Most of the giant forms of all the zoological branches disappeared all over the world before man had even arrived. Those evolutionary bursts of activity, when forms diversified, always tending to giant types in the end, belong to the past. I have already remarked that the Tertiary era did not see the birth of any really new type of animal. Our own era is hardly likely to witness anything sensational in evolutionary enterprise.

This does not necessarily mean that the animal world is in decline. But the period of life's great experiments and multiple attempts, which were often extravagant and destined to failure, certainly seems to be past. Palaeontological collections are like museums of early flying machines or the first locomotives: mines of inspired discoveries, but how many clumsy failures!

Constantly weeded out by the merciless forces of natural selection, only the most flexible, the most adaptable to changing conditions have survived today: at least they are the only ones to show real vitality. Mice and men, swallows and flies are the most characteristic examples. The battle has been won by simplicity of line, balance and harmony of form, medium size, light weight and sober colours; economy of weight and strength, economy of means. The age of giants is past. The giant amphibians, reptiles and birds have all disappeared with only a few exceptions. In 50 or 100 years the last of the very large mammals—rhinoceroses, elephants, hippopotami, buffalo, antelopes, deer, zebras, bears, lions and apes—will have vanished, except in those museums of obsolete zoology, the nature reserves and national parks.

In Madagascar fortunate circumstances have almost enabled us to watch the extinction of the giant fauna of the past, but we have missed our opportunity. We should take the lesson to heart, for there are still numbers of strange or giant forms of animals hiding in the more remote corners of the world, as is shown by the persistent and often exact reports that I have recorded here. Are we to let these monsters die out without attempting to know them? Surely the inquiring spirit of Aristotle and Pliny, Gesner and Aldrovandus, Buffon and Darwin is not dead?

In a sense I hope that it may be. Now that I have reached the end of this book I feel a vague sense of regret—regret that I have revealed the still-undisturbed retreat of so many unknown animals. When I think

of what man has done with a rifle, I am horrified that I should offer him new targets.

The most dreadful of the monsters I have mentioned attacks man only in self-defence or to provide himself with food. Only man kills for pleasure. I hope that the International Union for the Conservation of Nature and Natural Resources, which has already begun to do such good work, lays down an absolute prohibition to protect the creatures which are still unknown to science and are obviously interesting to all.

No sooner is one of them discovered than the hunt for trophies begins. These maniacs must be stopped at once. History shows how alarmingly quickly man can exterminate a whole species. We have hardly known our noble cousin the gorilla for more than a century, yet, despite the tireless efforts of those institutions set up to protect him, he has been ignominiously slaughtered, and perhaps will soon vanish without our having learnt anything about his habits, so full of significance from our own point of view.

Tomorrow we may know one of our other relatives: the abominable snowman, for instance, who is surely a shy and gentle great ape; or perhaps an even more human primate like the tiny *agogwe* or the elusive *orang pendek*. I hope with all my heart that when he is captured there will be no needless murder.

Have pity on them all, for it is we who are the real monsters.

Paris, 1958.

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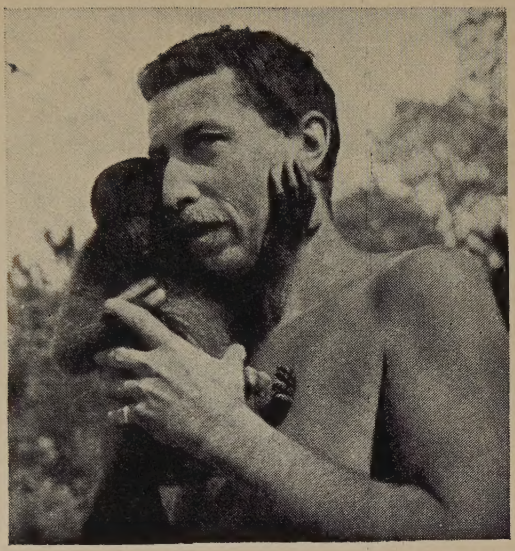

THE AUTHOR

with his woolly monkey Belinda

Bernard Heuvelmans was born in Le Havre in 1916 of Belgian parents in exile. From the first he was fascinated by animals and has kept all sorts of them, being now particularly devoted to monkeys. At school he shocked his Jesuit teachers by an unholy interest in evolution and jazz, and at the Université Libre of Brussels he received a doctorate of zoology with a thesis on the aardvark's dentition (hitherto thought to be unclassifiable) as well as winning first prize for small bands at an International Congress of Amateur Jazz. He had no sooner been called up for military service in Belgium than war broke out. Captured by the Germans he escaped four times before he was able to eke out a living as a professional jazz singer until he was given the chance of writing a regular column on the history of scientific humanism. This entailed a study of all branches of science, in the spirit of the humanist thinkers of the Renaissance, for he was already convinced that many problems could not be solved by a single scientific method. Although the Germans were so offended by his writings that they arrested him, the Belgians did likewise after the Liberation because he had written at all. Despite this discouragement he continued to publish articles on all kinds of scientific matters until he was able to migrate to Paris, where he became more and more interested in the subject of unknown animals. He is at present working on a book about unknown marine animals, the first volume of which has recently been published in France. But the subject which has always interested him most is that of man's origin, "most of the accepted theories about which are based on false premises." He is married to Monique Watteau, who drew the delightful pictures in this book, and who gave up a promising career on the stage to prove herself a talented and original novelist.

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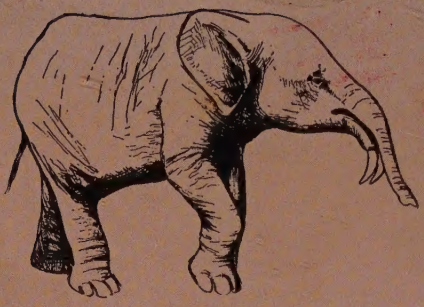

BERNARD HEUVELMANS

On the Track of Unknown Animals

With an Introduction by

GERALD DURRELL